

A Database Publication

# electron

Vol. 4 No. 7 April 1987 £1

## user

Fight against  
time in ...

### DRAGON'S DOOM

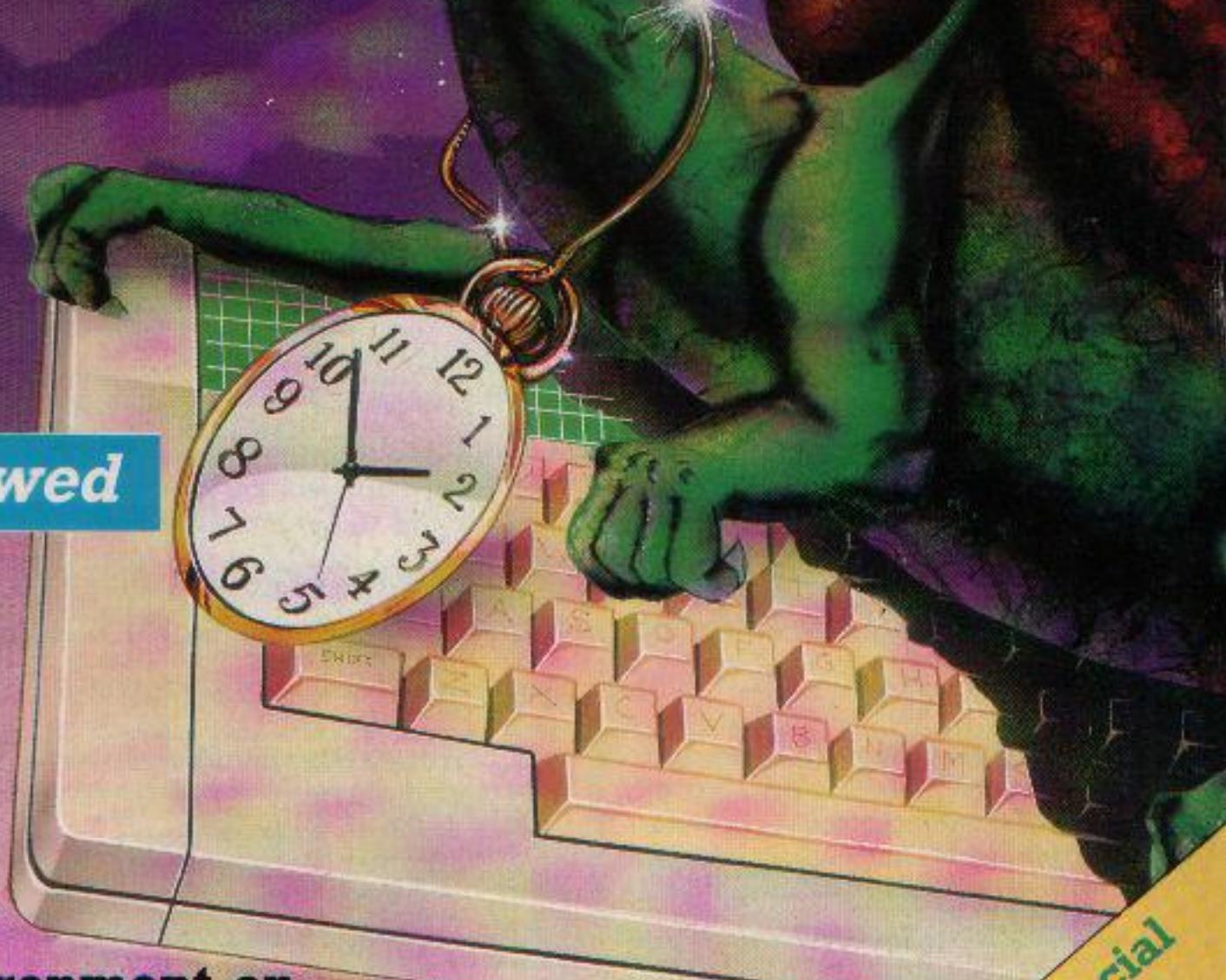
*Build your own  
games paddle*

*AMX Mouse reviewed*

### WIMPS

Create a Gem-like environment on  
your Electron with windows, icons, clock,  
card index, notebook, art package ...

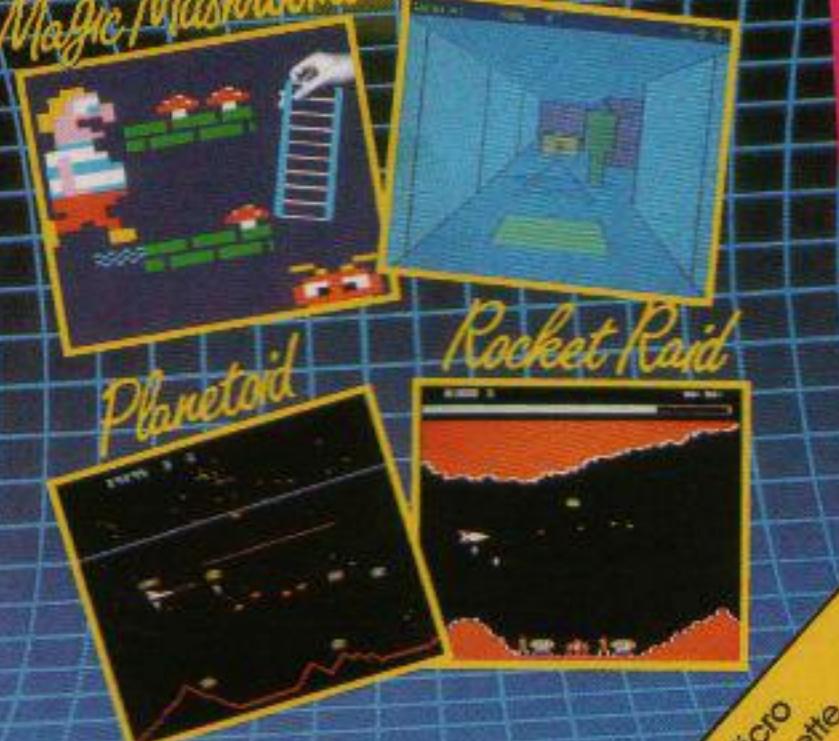
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# The Acornsoft Hits Volumes 1 & 2

**The Acornsoft Hits Volume 1**



*Magic Mushrooms* *Maze*  
*Planetoid* *Rocket Raid*

**SUPERIOR SOFTWARE** **ACORN SOFTWARE**

BBC Micro Dual Cassette £9.95

**The Acornsoft Hits Volume 2**



*Starship Command* *Arcadians*  
*Labyrinth* *Meteors*

**SUPERIOR SOFTWARE** **ACORN SOFTWARE**

BBC Micro Dual Cassette £9.95

These Acornsoft Hits compilation packages are the results of the recently announced venture between Superior Software and Acornsoft. The games have been carefully chosen to offer a balanced selection of the very best of Acornsoft's classic titles... at a price that is simply stunning value-for-money.

## Acornsoft Hits Volume 1

**Magic Mushrooms** "What's magic about Magic Mushrooms? A lot. It's great stuff; go and buy it — you won't be disappointed."... Acorn User.

**Planetoid** "It's fast and fun, annoying and addictive. In fact, it's one of the classic micro arcade games."... Electron User.

**Maze** "Maze has certainly become my favourite pastime for the moment, and I'm sure I'll be playing it for some time to come."... Acorn User.

**Rocket Raid** A superb sideways-scrolling arcade style game. You must fly your spaceship through the planetary caverns wherein are deadly aliens, guided missiles, meteor storms and many other hazards.

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BBC Micro 5 1/4" disc	£11.95
BBC Master Compact 3 1/2" disc	£14.95

### Acorn Electron Versions

Rocket Raid and Labyrinth are not available for the Acorn Electron. The Acornsoft Hits Volume 1 features: Magic Mushrooms, Planetoid, Maze, Monsters. The Acornsoft Hits Volume 2 features: Starship Command, Arcadians, Meteors, Snooker.

### Acornsoft Hits Volume 2

Acorn Electron dual cassette	£9.95
BBC Micro dual cassette	£9.95
BBC Micro 5 1/4" disc	£11.95
BBC Master Compact 3 1/2" disc	£14.95

The BBC Micro versions are compatible with the BBC B, B+ and Master Series computers.



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## News

All that's new in the ever-expanding world of the Electron.

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The popular series looking at the serious side of the Electron continues with a discussion of page layout, stored commands and more editing functions.

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Order your tickets here and make a date in your diary for the only show dedicated to Electron and BBC Micro Users.

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Our panel of reviewers has been busy over the past few weeks: An arcade classic, two compilations and an adventure creator are among the packages evaluated.

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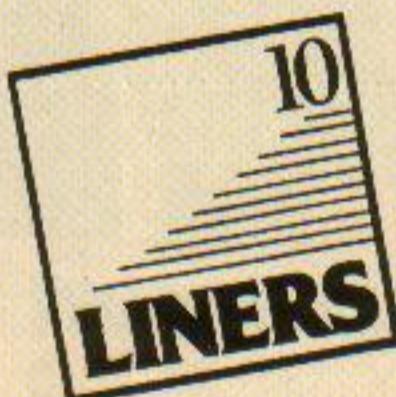
The AMX Mouse and AMX Art from Advanced Memory Systems come under the microscope this month.

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Part four of the series moves on to show how to build your own games paddle and measure the size of resistors.

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More tips, clues and magic spells from our resident wizard as he endeavours to help those stuck in far-away and long-forgotten lands.

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The plot thickens as our easy-to-read series delves deeper into the Electron's graphics commands, making the micro go dotty.

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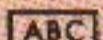
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Our down-to-earth series for those new to Basic investigates the INPUT command.

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## BBC Basic's great, says Sir Clive

THE Electron has a new relative - it speaks the same language as the new Z88 lap-held computer.

In a surprise move Cambridge Computer installed BBC Basic as the resident programming language and assembler in Sir Clive Sinclair's new baby.

The industry is waiting to see whether the Z88 booms like Sir Clive's previous computer endeavours, or flops like his C5 electric vehicle and mini TV.

Meanwhile Electron users are laughing behind their hands at the U-turn.

Sir Clive, once a vehement critic of BBC Basic, has now eaten his words.

The official line is that the language was chosen because it was established, totally debugged, fast, familiar and could lead to future advantage in the education market.

"BBC Basic? It's just what we needed", Sir Clive was overheard to say at a recent show.

DISC power is ensuring that the Electron is going from strength to strength.

To add to the renewed interest caused by the new production of the Plus 1, exclusively revealed in last month's *Electron User*, a wealth of new disc-based products will be on offer at the forthcoming Electron & BBC Micro User Show.

Slogger will demonstrate its Electron disc System. Designed to be compatible with the BBC Micro and the Acorn DFS, it includes commands to read 40 track discs to 80 track drive and RUNPROT for tape to disc users.

### Commands

The rom has 90 page documentation covering use of a disc system and descriptions of commands.

The company is at present bundling the rom with a Mitsubishi disc drive in a special low price package.

Also from Slogger will be Version 2 of its tape-to-disc copier which is said to load Superior's Elite in 30 seconds.

The software also allows Database Software's Mini Office to be transferred to disc in its entirety, leading to easier use.

But perhaps most interesting from the Electron game player's point of view, Slogger will introduce its fully

compatible joystick interface.

Supplied as a cartridge, it works with the Plus 1 or the company's own Rambox Plus.

Games which have a joystick option can be played as normal.

For those without the option, Slogger has introduced a new command: \*JOYSTICK, which allows the joystick to pretend to be any key on the board.

By public demand Superior has produced a compilation of games on disc. The Show will see the first set in the series, each of which will contain seven hits and a new title for £11.95.

Volume Three - the first for the Electron - includes Karate Combat, Repton, Deathstar, Repton 2, Overdrive, Smash

and Grab and Mr Wiz.

Watford's new range of peripherals will be on show for the first time. They include adjustable TV/monitor stands, 5.25in floppy discs, a disc file, an anglepoise copy holder, anti-glare filter, an easy holder, a 5.25in disc drive head cleaner and a printer stand. All will cost £25 or under.

For the first time, Shards Software's range of adventures will be released as a single-disc compendium for the Electron.

The compendium includes Operation Safras, Woodbury End, Pettigrew's Diary, Mystery of the Java Star and Galilee.

Tynesoft's latest sports simulation, Big K.O., will be presented at the Show, too.

## Games on the way

SOFTWARE house Superior has bowed to pressure from Electron Plus 3 users keen to find more programs for their discs.

Following a series of letters in recent issues of *Electron User* and an editorial recommendation to pester the company, Superior received a barrage of letters and calls saying: "Why not games on disc?"

The company said it

received more than 400 letters and phone calls. This, as well as proving that the Electron still has a large user base, also persuaded Superior that games on disc for the machine were viable.

As part of a series of new compilations, there will be one on 3.5in disc especially for the Electron. This will be on show at the Electron & BBC Micro User Show at UMIST Manchester.

# COMPETITION WAS A WINNER

More than 1,000 readers entered the double competition in last month's issue of *Electron User*.

And that resulted in a bumper postbag for hardware and software producer Advanced Computer Products which donated the contest's more than £500 worth of prizes.

Boss of APC, John Huddleston, told *Electron User*: "We've been bowled over with entries for what was possibly the most popular *Electron User* contest ever".

More than 200 entrants got

the quiz section of the 2-in-1 competition correct.

Winner of the first prize – an AP4 interface plus a 40/80 switchable double-sided Cumana disc drive – is Judith Bamber, of Runcorn, Cheshire.

The second prize – an Advanced Disc Toolkit and sideways ram goes to A.J. Gibbons, of Chelston, South Devon.

Winner of the third prize, an Advanced rom manager and Advanced rom Adapter 1, is William Darlington, from Glasgow.

This leaves Huddleston

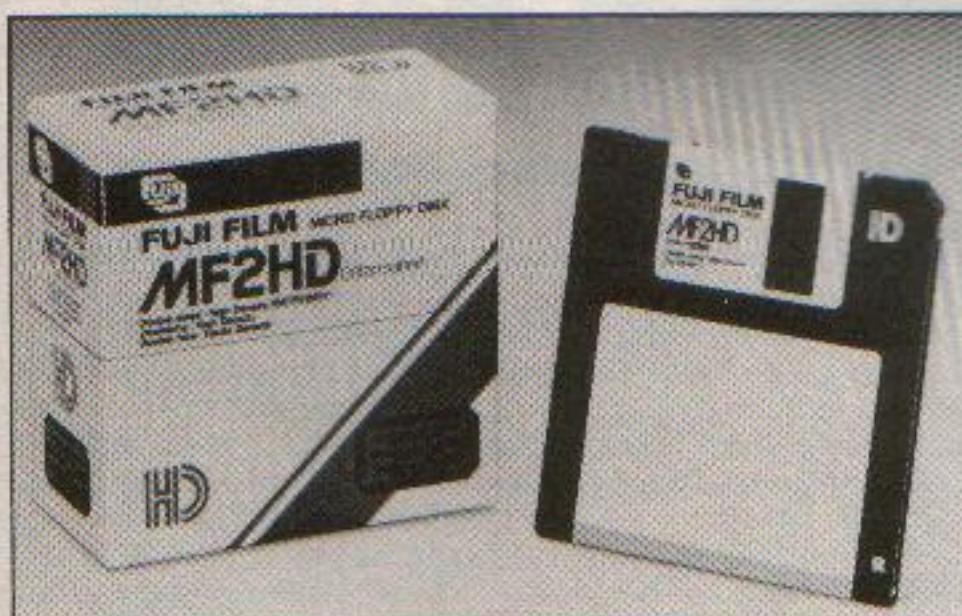
with the task of working his way through the masses of entries for the second part of the competition in which readers were asked to suggest new APC products for the Electron.

"It's a nightmare trying to work out who will be the winners. *Electron User* readers have come up with some very imaginative ideas for new products", he said.

The three prizewinners from this section of the competition will be announced in next month's *Electron User*.



John Huddleston ... "bowled over with entries"



## Mini disc has maxi memory

AS the use of discs with the Electron increases, a new product has been launched which claims to double storage capacity.

The MF2HD from Fuji Film has a memory of 1.6Mb, expandable to 2Mb, which means this double sided disc can store the equivalent of more than 625 pages of A4 text.

This, claims Fuji, is an increase of 60 per cent over standard 3.5in discs.

The company is also claiming increased reliability through the use of an ultra-thin shock absorbing magnetic layer.

Each disc is guaranteed to operate continuously on the same track for more than 20 million passes without deterioration in performance.

The disc comes in a plastic

wallet designed to withstand temperatures of up to 60 degrees Celsius.

To aid data protection the discs have a special "sensing hole" which enables the drive to detect whether or not the correct disc is being used.

The discs will be sold in packs of 10.

## Games update

KET, a new adventure trilogy for the Electron, is three games with the same theme.

Mountains of Ket, Temple of Vran, and The Final Mission pit the hero against a band of mad monks and the most beautiful woman in existence.

The games come together for £9.95.

★★★

NEW for the Electron from Epic is a follow-up to its bestselling game Wheel of Fortune.

The Lost Crystal is the company's first release in three years. It has 400 different locations, an advanced language interpreter, intelligent characters, real-time action, and help book. Price £9.95.

★★★

A BURST of activity at Blue Ribbon Software has resulted in two new games and three converted programs for the Electron.

New releases are pub game

simulation Bar Billiards and Condition Red in which the player has to hunt through 10 chambers to collect plutonium crystals.

The conversions are graphic space shoot-em-up Ravage, survival challenge Joey and three-games-in-one simulation Darts. Price £1.99 each.

★★★

A FOLLOW-UP to its best-selling arcade adventure Thunderstruck has been released for the Electron by Audiogenic.

Thunderstruck II – The Mindmaster is set in an underground cavern. Once again the player takes the role of Spreco, a space refuse collector.

Also new for the Electron from Audiogenic is Sphere of Destiny.

The game follows the quest of Bruce the Bashful Ball across the inter-starion freeway.

Both games cost £7.95.

## Alarm on the dole pays off

UNEMPLOYED electronics expert John Smith has found a way off the dole queue by making the world safer for Electrons.

He invented a portable alarm for micros and, with help from a Manpower Services Commission enterprise allowance scheme, has started a business to sell the

idea.

Trading as Heywood Electronics of Wellington, Somerset, Smith already has one order for 1,000 computer alarms from America in the pipeline.

A feature of the device is that once it has been activated by a thief it cannot be turned off or taken away.

# ACORN SOFTWARE ELECTRON BONANZA

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Acorn User, July '86

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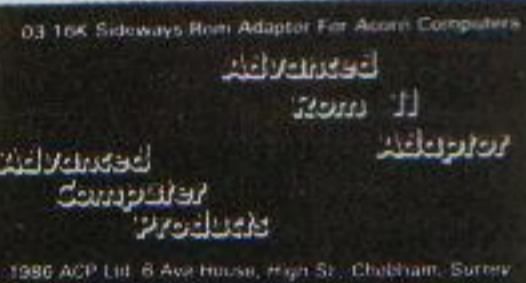
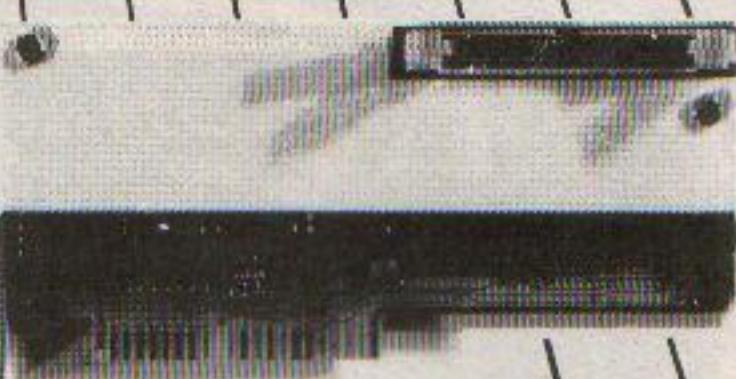
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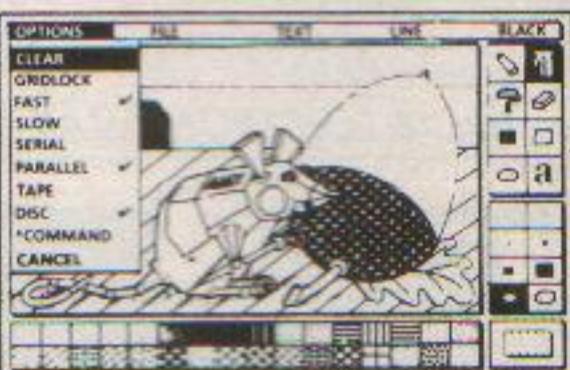
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The ACP/AMX mouse package may be used on an ELECTRON fitted with a PLUS I & AP5. The 'ART' software is supplied on cassette but can be transferred to DISC (DFS not ADFS)

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THE price of Electron software has fallen dramatically over the past year and it is now possible to buy some very powerful packages for a fraction of their original cost.

In this series we're looking at some of the more serious packages, showing what they are capable of and how to get the best out of them.

Last month I introduced you to View - an impressive word processor from Acornsoft - and we looked at some of the basic editing commands.

I'm going to assume that you've read this article, you know how to get View up and running, and can enter text.

This month we're going to move on to formatting and page layout. Finally, in the last part in this section on View there will be a complete spelling checker to catch any slips or typing errors you may make.

Before we start to look at formatting and page layout we need some text so type in the three short paragraphs shown in Figure 1. Use tabs (Func+I), to indent the start of each one.

Up until now the width of the text has been the width of the mode 6 screen. However, we can change that quite easily. Move the cursor to the start of the second paragraph and press Func+, (hold down the Caps Lk/Func key and press comma).

You'll see a dotted line with asterisks appear, just like the one at the top of the screen. This is called the ruler.

The length of this line determines how wide the

# We've got designs on your Electron

**With View up and running, ROLAND WADDILOVE looks at formatting and page layout**

text is, both on screen and on paper, when it is finally printed out.

The asterisks printed at regular intervals along the ruler mark the tab positions. If you press Func+I when entering text the cursor moves so that it lies directly beneath the next asterisk.

Move to the start of the ruler on the left of the screen. Make sure you're in overwrite mode (if there is an I in the top left corner of the screen you are in insert mode, so press Func+W), and overwrite the dots up until the first asterisk by holding down the spacebar.

Now place a > and move to the second to last asterisk. Place a < here and overwrite the remaining dots with spaces. Finally press Return.

What we've done is to design a new ruler setting a new width for the text. This is the distance between the angled brackets.

Notice that the text hasn't been altered at all, so press Func+B. This instructs View to format the following paragraph, ensuring that the edges line up with the markers at either end of the ruler.

Format the next paragraph by moving to its start and press Func+B again. Move your cursor to the start of text with Func+2 and you should now have a screen that looks like Figure 1.

Don't worry about the ruler appearing in your letter or document when you print it out, View skips this and carries on printing the following text at the new width. The ruler is printed

on the screen but not on paper.

Let's restore our text to its original form: Move the cursor to the ruler in the middle of the screen and press Func+8 to delete it.

Of course, the text below is still at its old width. We could use Func+B to reformat it, but there is an alternative. Tap the Escape key to enter command mode and format the whole of your text from beginning to end with:

FORMAT

and when it has finished tap Escape again to re-enter edit mode, pressing Func+2 to move to the start of text. Your screen should look like Figure 1 again.

You now know how to

FJI.....\*.....\*.....\*..<  
The price of Electron software has fallen dramatically over the past year and it is now possible to buy some very powerful packages for a fraction of their original cost.

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Last month I introduced you to View - an impressive word processor from Acornsoft and we looked at some of the basic editing commands.

Figure 1:  
Standard width text

FJ .....\*.....\*.....\*..  
 The price of Electron software has fallen dramatically over the past year and it is now possible to buy some very powerful packages for a fraction of their original cost.  
 >.....\*.....<  
 In this series we're looking at some of the more serious software packages, showing what they are capable of and how to get the best out of them.  
 Last month I introduced you to View - an impressive word processor

Figure II:  
 Altering the width of the text

alter the width of your text. You can do this as often as you like and use as many rulers as you need.

One final point: The width of your ruler and text isn't limited to the width of the screen, it can be over 130 characters wide.

If you make the ruler wider than the screen, the screen becomes a window on the text. This window will move left and right following your cursor.

When you move to the left margin you see the first 40 characters on each line. When you move to the right you see the last 40 characters, and in the middle you see the middle section.

Now we'll join paragraphs one and two together. Move to the end of the first paragraph just after the full stop. Press Func+/, remove the tab with Func+G and insert a space with Func+9.

Unfortunately, this has totally ruined our nicely formatted text, but this is easily remedied. Move to the start with Func+2, reformat it with Func+B and your screen should look like Figure III.

As we've seen, two paragraphs can be joined using Func+/. We can also carry out the exact opposite process and create two paragraphs from one long one.

Move to the word that

originally started the second paragraph (you have just joined them together) and press Func+. (Function and full stop) to split the line.

Move to the new paragraph with Func+F and insert a tab with Func+I. Now reformat the paragraph with Func+B and you should be back to Figure I again.

Have you noticed that the left and right edges of your text are nicely lined up, just like the text on this page?

This is called justification. The J in the top left corner of the screen shows that justification is on. However, if you don't like it this way you can turn it off with Func+K.

Press Func+2 to move to the start of text, switch off justification with Func+K

and reformat it with Func+B.

Notice the difference. The right hand edge is now ragged. But you can restore the original format with Func+2, Func+K, Func+R. So you have a choice of either a straight or ragged right edge.

We'll now move on to page layout and stored commands. This is an important and powerful feature of View and well worth mastering.

A stored command is one that is stored in the margin of the document. It does not have any effect on the text on the screen but it does effect how it looks on paper when printed out.

Figure IV shows a typical document with header and

footer. A header is a line of text printed at the top of each new page and a footer is printed at the bottom. It's often used for titles, chapters, names and so on.

We'll see how to create this document using View's stored commands.

When it comes to printing out your text, View needs to know how deep your paper is. This is called the page length or PL for short.

This information may be found in your printer manual but if it isn't you can always discover it by trial and error.

Move to the start of text with Func+2 and create some space by inserting seven blank lines with Func+7.

Press Func+O and type:

PL

not forgetting to press Return afterwards. Now enter the page length:

60

and press Return again. Don't worry about this blank line, it will be skipped when the document is printed.

The distance from the top edge of the paper to the header is the top margin, TM. Move down to the second blank line on the screen, press Func+O, and type:

TM 3

pressing Return after TM and 3.

Figure III.  
 Joining paragraphs

FJ .....\*.....\*.....\*..  
 The price of Electron software has fallen dramatically over the past year and it is now possible to buy some very powerful packages for a fraction of their original cost. In this series we're looking at some of the more serious software packages, showing what they are capable of and how to get the best out of them.  
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\*\*\*\*\*



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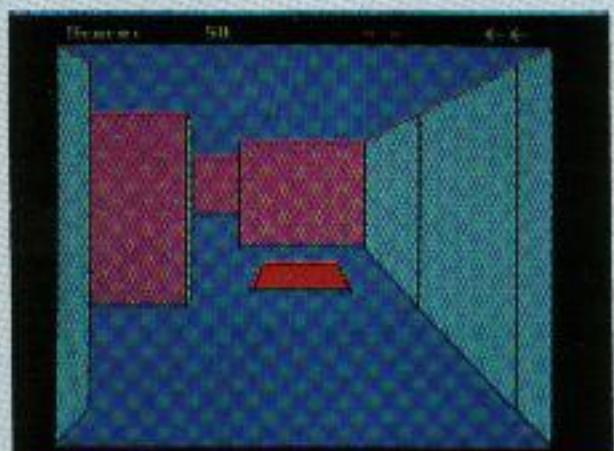
Volume 1 starts with *Magic Mushrooms*, which in my opinion is one of the best games Acornsoft ever produced. It is a ladders and platforms game in which you guide our hero, Murphy, along a series of escalators and conveyor belts, slides and trampolines, and past the odd nasty or two.

The object is to collect mushrooms dotted about the screen, but many other features appear in the nine screens making up the game.

You also have the facility to create and save your own screens, so it is possible to design them to be well within the limits of the newest novice or to test the most experienced. The sound is pleasing and the graphics colourful and well designed.

In *Planetoid*, a version of the arcade game *Defender*, the screen scrolls sideways allowing your spaceship to destroy raiders intent on kidnapping humans from the planet's surface. These alien invaders come in a variety of shapes all having their own method of attack.

This version is very fast. Smart bombs allow you to wipe out all the aliens on the screen, and a hyperspace



button means you can teleport out of danger.

*Maze* has simple but effective 3D graphics which change fairly quickly to give a good illusion of movement. You start on level one of a secret installation and must find three tags hidden in the maze. This will allow you to open a box and release the key which operates the lift to the next floor.

You can view a map of the maze, but this will only show those corridors which you have already travelled along. The position of the evil security robots is also indicated.

*Monsters* is another ladders and platforms game where you dig holes to trap the monsters, then fill in the holes before they can escape.

I was surprised to find two similar games in this compilation — I wonder if it wouldn't have been better to have replaced *Monsters* with another type. In spite of this, the pack represents excellent value and is almost worth buying just for *Magic Mushrooms*.

Volume 2 starts with *Arcadians*, an invaders-style offering in which the aliens are not happy to line up and be zapped — they randomly peel off from their formation to divebomb you.

It's simple but very playable, definitely one of the "let's have one more



try" type. Both sound and graphics are good and make this a very professional game.

*Meteors* comes next, and although a classic, I'm afraid it does look a little dated. Your spaceship sits in the middle of the screen as a meteor shower drifts across its path.

As you blast each boulder it breaks into smaller particles until finally it disappears. When all the meteors have been atomised another screenful appears.

The only variety is the periodic visit from one of two types of alien ships which buzz across the screen firing at you. However you get the feeling that they are only halfhearted about it all. Graphics are black and white only. I feel this one would have been better



left gathering dust in the archives.

*Snooker* is for two players, and is the best computer version I have seen. You play and score as in the original game and have the option of adding topspin or backspin to your shot.

The strength of shot can be adjusted by varying the length of cue shown on screen, and the effects of hard shots are realistic, with balls scattering in all directions.

*Starship Command* is a space shoot-'em-up in which your battleship stays in the centre of the screen and the universe rotates around you.

As well as the viewscreen there is control panel and radar scanner to warn you of oncoming aliens, some of which are invisible. If your energy becomes low you may launch an escape capsule to return to starbase, where, depending on your prowess, you may be given another ship and another mission. If you are too late to launch an escape capsule you will be given a posthumous rating.

It's always easier to criticise than create, but I feel that Volume Two could have been improved by dropping *Meteors* and including a different type of game, perhaps *Monsters* or *Boxer*, another excellent ladders and platforms game.

If you don't already have these games as singles they are definitely worth buying, and if you have to make a choice I'd put Volume 1 as being the better value.

Beejay



Sound	7
Graphics	7
Playability	8
Value for money	9
Overall	8

## Red alert

Program: Condition Red  
Price: £1.99  
Supplier: Blue Ribbon, CDS House, Beckett Road, Doncaster.  
Tel: 0302 21134

CONDITION RED refers to the danger point in an atomic reactor, and this offering from Blue Ribbon has you set in a malfunctioning plutonium plant where you are required to collect 50 plutonium crystals before a meltdown occurs.

This is a ladders and platforms game, and the plutonium crystals are spread over 10 screens, any of which may be accessed by means of a password.

A full list has been provided to enable you to enter any particular screen while in practice mode.

Controls are fairly standard, with Z and X providing the left and right movements and the Return key for jump.

It is possible to pause the action and switch off the sound effects. Plus 3 owners should ensure that the ADFS

is disabled before loading.

The various hazards range from collapsing floors to electrified ones – and the conveyor belts and escalators can carry you straight into trouble.

You must learn to cope with a fancy line in mutating monsters, and to make matters worse you are only equipped with a limited air supply, though this will be topped up after you complete each screen.

You start the game with three lives, but an extra one is given after every second screen.

Mode 2 is used for the graphics, and they are therefore extremely colourful. All the characters are remarkably well drawn, in fact one mutant, which resembles a little pink devil with white horns, is so appealing it is almost a pleasure to fall foul of it. Unfortunately the sound effects let the game down a little.

Movement is very smooth in spite of the fact that a lot is happening at once on each screen, and key presses in particular are very responsive.

It is easy to forget when playing this



game that it is in a budget price range, as the appearance is so good.

It is only let down by a lack of variety of mutants, as there are basically only three types – a devil, a robot and a bug eyed monster, all of which make quite predictable horizontal or vertical movements.

It would have been nice to have had a screen designer, but for £1.99 you can't complain.

Beejay

Sound.....	5
Graphics.....	7
Playability.....	7
Value.....	8
Overall.....	7

## Pacman revisited

Program: Crystal Castles  
Price: £9.99  
Supplier: US Gold, Unit 2/3 Halford Way, Halford, Birmingham B6 7AX.  
Tel: 021-356 3388.

THE original Crystal Castles was an Atari arcade game. Now this Pacman variant has found its way on to the Electron – about two years too late.

Pacman, as you will remember, was designed around a maze in which the pathways were covered with dots. Crystal Castles uses the same idea, but divides the maze into squares.

These are then raised to create ramps and towers. Some of the taller towers can only be reached using lifts; others have tunnels beneath them.

Controlling a small character who looks like a little devil, you run round the maze collecting gems. Clear one maze of gems and you move on to the next.

Life is made difficult by the presence of an entourage of evil characters. First come the red balls.

There are only two on the first screen, but they are adept in luring you into corners.

Screen two sees the arrival of the trees, which operate in the same way as the balls but in greater numbers.

Other nasties include gem-guzzling caterpillars, a skeleton and a wicked witch.

Dawdle too long on any screen and a whirlwind appears to add to your problems. Fortunately there is a wizard's hat which when collected will provide you with temporary immunity against the nasties.

Having sped through the first six screens I was asked whether I wished to load a new set of nasties. If you want to amass a huge score reply no to this question as you will be returned to screen one and be allowed to run through all six screens again – with no increase in difficulty.

The castle files are only four blocks long and don't take long to load. However this loading routine every six screens will no doubt become tedious.

The 3D effect may have been clever



two years ago but is nothing special now. Animation is smooth, but some of the characters are poorly defined.

If you're feeling nostalgic and would like your own copy of Crystal Castles then be my guest.

On the other hand, unless you want an old fashioned game that wouldn't keep the average termite amused for more than five minutes, stay well clear.

Jon Revis

Sound.....	5
Graphics.....	7
Playability.....	5
Value for money.....	5
Overall.....	5

# Do-it-yourself adventuring

**Program:** *The Adventure Creator*  
**Price:** £14.95 (cassette)  
**Supplier:** Incentive Software, 2 Minerva House, Calleva Park, Aldermaston, Berkshire RG7 4QW.  
**Tel:** 07356 77288

TWO years ago I bought a copy of Jonathan Evans' Adventurescape for the Electron and spent many pleasant evenings constructing my first and only text adventure.

Since that time the market has been almost swamped with adventure-writing aids such as Gilsoft's *The Quill*, Logotron's *Adventure Writer* and LTS's *Your Adventure*.

I was therefore particularly interested to see how this new offering from Incentive compared with its peers, and especially concerned to ensure that it wasn't just a watered-down version of its big brother, *The Graphic Adventure Creator*.

I am not overly fond of graphically-illustrated adventures, and to my delight *The Adventure Creator* pretends to be nothing more than a very user-friendly utility for writing text-only adventures.

The package is attractive and houses a single cassette with an easy to understand 24 page manual. No programming experience is required to use it, which is perhaps one of its greatest attractions to adventure buffs. It is, however, an essential prerequisite to read the manual very carefully before launching into your first silicon fantasy.

The tape consists of four main files – *The Adventure Creator* – which is obviously the core program, a Quickstart file (an excellent help facility for the true novice), *Advman* (a small adventure from the manual which acts as a tutorial guide), and *Ransom* (a super demonstration adventure).

On loading you are presented with a menu which, although lengthy, soon becomes familiar. For instance pressing V allows you to set up and edit up to 255 verbs, such as GET, DROP, and EAT, which you may wish to use in your adventure, although the Quickstart file will supply you with a list of the more commonly used ones.

Pressing R on the main menu allows you the facility to enter room descriptions such as "You are in a dark, dark cabin with a hint of sunlight slipping through a narrow crack in the window boarding".

Only the amount of free memory limits the number of locations you can create, and obviously the briefer the descriptions, the greater the number

of rooms you can cram in.

If you press M on the menu you can enter up to 255 messages which will form the responses within the framework of your completed adventure.

Pressing N presents you with a set-up/edit option of nouns, and A provides adverbs which will allow your actions to be more realistically described.

The trickiest part of writing any adventure is setting up the puzzles. In Adventurescape and *The Quill* this was achieved by a flag-setting option.

However *The Adventure Creator* uses a conditions system which, though perplexing at first, is more user-friendly than the alternatives.

Having digested the more difficult bits you now progress to *Advman*, which allows you to journey at your own pace through a tutorial type adventure using the manual and tape.

You can simply view and fiddle or, like me, redescribe the given locations and have immense fun customising your own mini adventure. In doing so you will soon become familiar with the workings of the creator.

*Ransom* is an enjoyable demonstration adventure, but not altogether essential to beginning to write your own much better jaunt.

The text compression facility is good, as is the response to synonyms of commands and actions – so much so that Steve Maltz at Shards used this program to write *Operation Safras*, a BBC Micro and Electron best-seller.

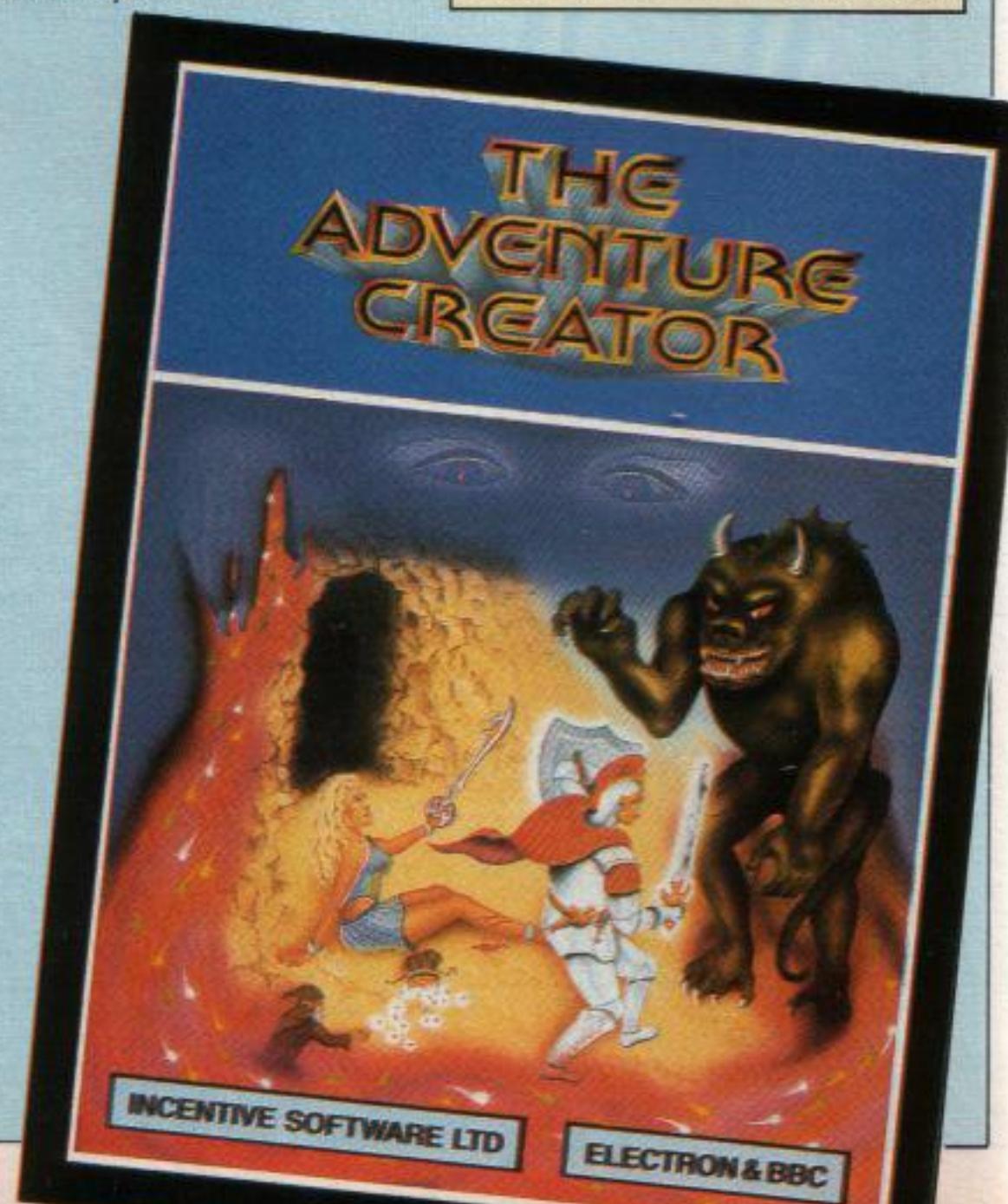
*The Adventure Creator* has the extra command Chain, which allows you to create massive multi-part tape-based adventures such as the infamous Lord of the Rings and the more recent Ket Trilogy.

Comparison with other adventure-writing utilities is difficult as each has its own advantages and disadvantages. I found the limitations of tape a little frustrating, and hope that Incentive will soon bring out 3.5in and 5.25in disc versions for the Electron.

Conversely, I found the speed of operation of the program and the commonsense of the manual an absolute joy. It certainly isn't a poor relation of its stablemate, *The Graphic Adventure Creator*, as precious memory is not taken up by irrelevant pictures, which means more text for your masterpiece.

Pendragon

Documentation	9
Ease of use	9
Value for money	9
Overall	9



# ROUTINES PRINTING

IN his series starting in the April 1986 issue of *Electron User* John Woolard explored the osword system of calls on the Electron.

He explained how an osword call with `A%=&0A` will generate the dot matrix pattern of any Ascii character and how this will provide the programmer with the raw materials for a variety of interesting printing effects which are of particular use in the production of title pages and eye-catching labels.

So osword lets us take letters apart to provide a series of eight numbers. The question is now what can we do with them?

VDU 23 comes to the rescue, and by feeding the

```
10 REM Program I
20 REM Underline
30 MODE 4
40 PROCunderline("ELECTRON
USER",13,15)
50 END
60 DEFPROCunderline(A$,x,y)
70 LOCAL b,j,k
80 b=&9000: A%=&10:X%=&b:Y%=&b
90 FOR j=1 TO LEN(A$)
100 ?b=ASC(MIDS(A$,j,1)):CAL
L &FFFF1
110 VDU23,230:FOR k=8 TO 1 S
TEP-1:VDU b?K:NEXT
120 PRINT TAB(x+j-1,y)CHR$23
130 NEXT
140 ENDPROC
```

Program I

eight numbers back into a single character we can produce some novel effects.

For example, if we subtract each of these numbers from 255 and feed them back we will get colour inversion.

This could equally well be done by using the colour commands, but what COLOUR cannot do is invert part of a character.

After an osword call partial inversion becomes possible and Program I demonstrates this, inverting the bottom line of the new display to underline automatically.

By changing the conditions for inversion it is a simple matter to end up with letters that are half inverted, or indeed with other patterns.

To get the idea try modi-

```
10 REM Program II
20 REM Inversion
30 MODE 4
40 PROCinversion("UPSIDE DOWN
",14,15)
50 END
60 DEFPROCinversion(A$,x,y)
70 LOCAL b,j,k
80 b=&9000: A%=&10:X%=&b:Y%=&b
90 FOR j=1 TO LEN(A$)
100 ?b=ASC(MIDS(A$,j,1)):CAL
L &FFFF1
110 VDU23,230:FOR k=8 TO 1 S
TEP-1:VDU b?K:NEXT
120 PRINT TAB(x+j-1,y)CHR$23
130 NEXT
140 ENDPROC
```

Program II

fying Program I by typing in:

```
120 FOR K=1 TO 8
130 IF K<=4 VDU b?K ELSE VDU 2
55-b?K
135 NEXT
```

So far we have seen colour inversion, but we can

interpret inversion more literally and turn the letters upside down. Program II does this by reading the codes in reverse order.

Becoming a little more ambitious, we can split letters into two to produce double height, double width and other effects.

Double height print routines are published quite regularly so I'll concentrate on some of the other possibilities, starting with double width.

To understand how doubling the width works let's look at a single row from an Ascii character shown in Figure I.

To double the width of the row at the top and at the same time retain the pattern you have to double each bit in turn.

As you can see, it is quite difficult to see any simple mathematical relationship between the old and new codes.

It is at this stage that machine code programmers normally take over, because the calculation in Basic is unacceptably slow.

Such machine code programs are, of course, very efficient, but many Basic users find them difficult to adapt to their own requirements.

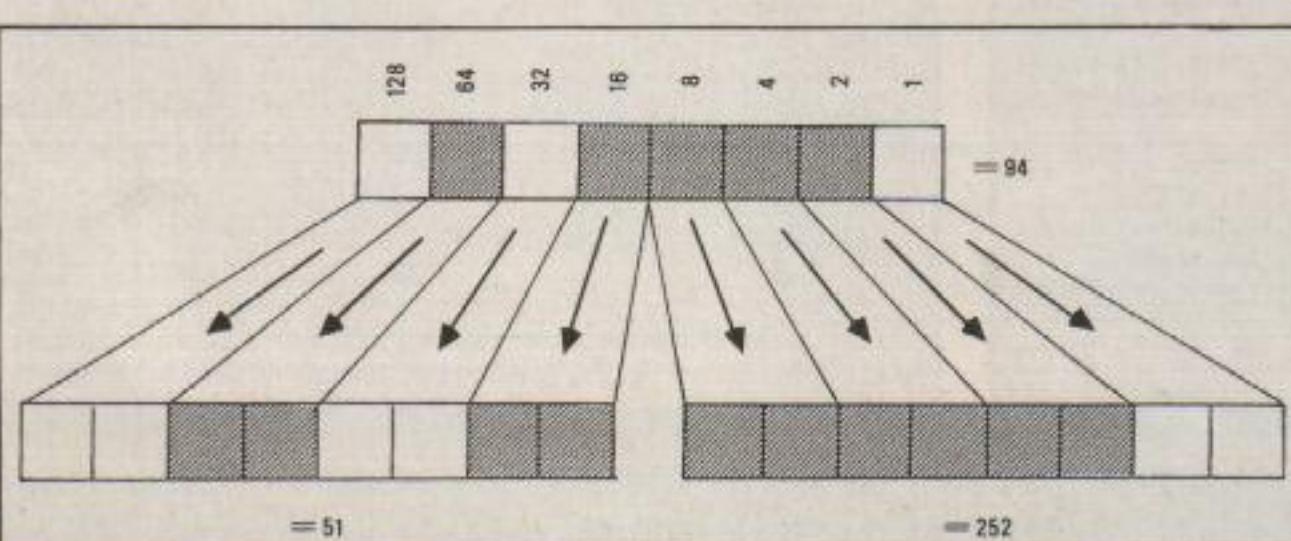


Figure I: Doubling the width

## From Page 19

The way round this problem is simple enough – forget about the calculations, and look at Figure II.

When we double up a letter's width what we do is to use four bits of the old letter code to produce the new.

Because each bit can only be on or off – 1 or 0 – there are only 16 possible answers, and four of these

```

10 REM Program III
20 REM Double Width
30 AS$="DOUBLE WIDTH DEMO FOR ELECTRON USERS":len=LEN(AS$)
40 MODE 4:b=8900:AX=8A:XZ=b
:YI=b DIV &100:DIM wide(15),Ln(8),rn(8):FOR J=0 TO 15:READ w
ide(J):NEXT
50 DATA 800,803,80C,80F,830
,833,83C,83F,8C0,8C3,8CC,8CF,&
F0,&F3,&FC,&FF
60 CLS:PRINT TAB(2,12)AS$
70 FOR J=1 TO len:?b=ASC(MI
DS(AS,J,1)):CALL &FFF1
80 FOR K=1 TO 8:in(K)=wide(b?K MO
D &10):NEXT
90 VDU23,230:FOR K=1 TO 8:V
DUin(K):NEXT:VDU23,231:FOR K=1
TO 8:VDUrn(K):NEXT
100 y=2*((J*2) DIV 38):x=(J*2
) MOD 38:PRINT TAB(x+y,y+16)C
HR$230;CHR$231
110 NEXT

```

Program III

are illustrated in the figure. This process is shown in Program III. Values for each "old" letter code from 0 to 15 are doubled as in Figure II and the new values appear in the data line to be read into a small array.

I have used hex for this data as a pattern in the sequence is clearly seen.

```

10 REM Program IV
20 REM Double Height and Wi
dth
30 MODE 4
40 PROCwidedata
50 PRINTTAB(1,12)"GETTING H
IGHER TOO!"
60 PROChigh("GETTING HIGHER
TOO!",1,15)
70 END
80 DEFPROCwidedata
90 DIMwide(15),ll(8),rr(8)
100 FOR J=0 TO 15:READ wide(
J):NEXT
110 DATA 800,803,80C,80F,830
,833,83C,83F,8C0,8C3,8CC,8CF,&
F0,&F3,&FC,&FF
120 ENDPROC
130 DEFPROChigh(AS,x,y)
140 REM=GRAPHICS MODES ONLY
==

150 LOCAL b,CS,J,K

```

Program IV

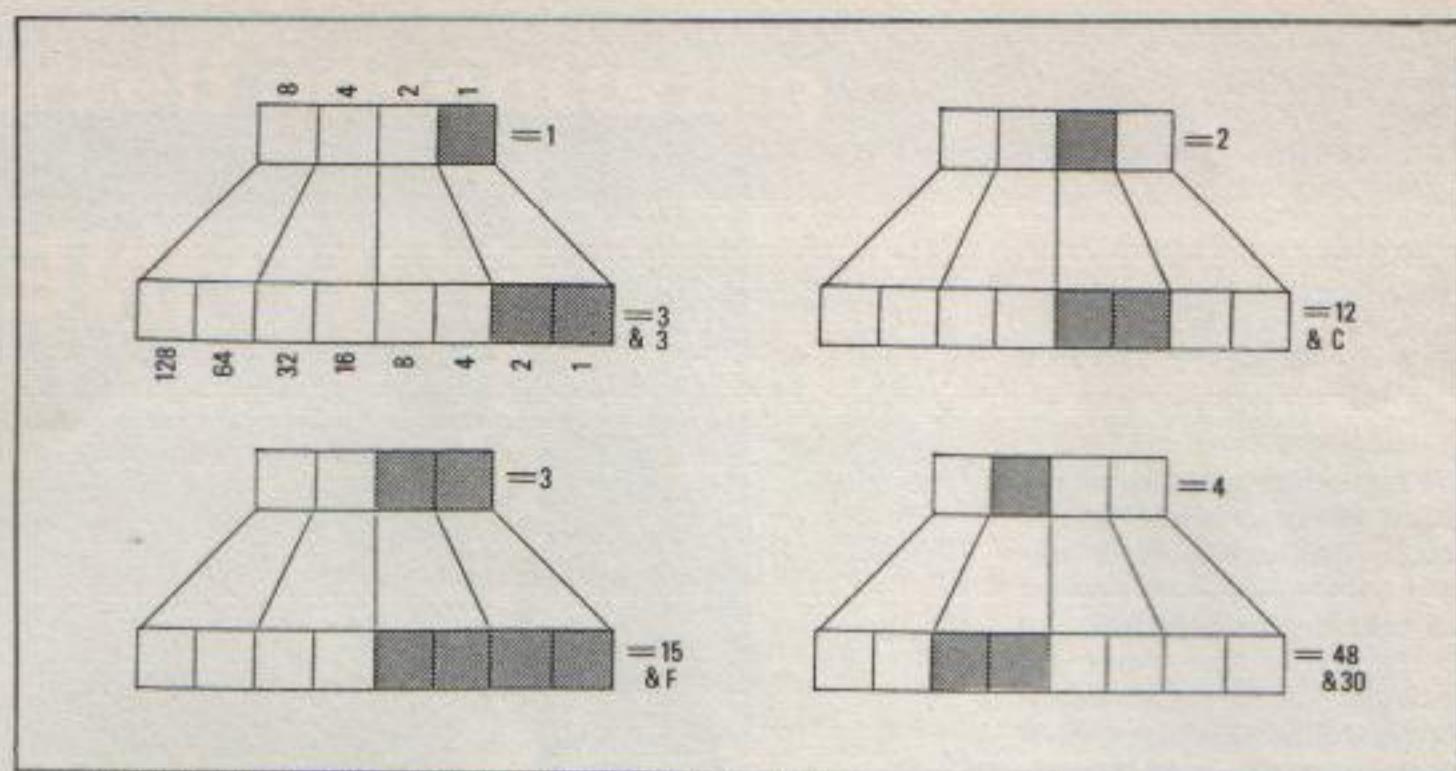


Figure II: Calculating the data for double width characters

Now to double the width of the letter we first set up the osword call. The eight values produced are then split into left, *ll* and right, *rr* halves by dividing by &10 (16) and taking the remainder using DIV and MOD.

The values stored in the *ll* and *rr* arrays are then converted to their doubled values by looking up the new value from the *wide* array.

We then use VDU 23 to produce two new characters each corresponding to half the old one.

These can then be printed together to produce double width.

Remember, though, that the new characters are separate and there are many other possibilities, such as colour changes or small displacements using VDU 5.

Program IV uses the same

method combined with the ubiquitous double height routine to define four characters, which when printed together produce giant letters for titles.

Program V uses a very similar system to that used in Program III to reverse letters.

The logic here is much the same but the data is different as is the process of constructing the new character.

Program VI can be used to write vertically up or down the screen. However, this is very slow as 64 pixels must be rotated through 90 degrees for each character printed.

The methods used in these programs allow new characters to be defined and printed very quickly, but just as importantly they can be combined and extended to produce even more interesting effects.

```

10 REM Program V
20 REM Reversal
30 MODE 4
40 PROCredata
50 PROCreverse("RUSSIAN ELE
CTRON USER",9,15):PRINT?
60 END
70 DEFPROCredata
80 DIMrev(15),ll(8),rr(8)
90 FOR J=0 TO 15:READ rev(J
):NEXT
100 DATA 60,68,64,80,82,8A,&
6,8E,81,89,85,8D,83,8B,87,8F
110 ENDPROC
120 DEFPROCreverse(AS,x,y)
130 LOCAL b,J,K
140 b=8900:AI=10:XZ=b:YI=b D
IV &100
150 FOR J=1 TO LEN(AS)
160 ?b=ASC(MIDS(AS,J,1)):CAL
L &FFF1
170 FOR K=1 TO 8:rr(K)=b?K D
IV &100:ll(K)=b?K MOD &100:NEXT
180 FOR K=1 TO 8:rr(K)=rev(r
r(K)):ll(K)=rev(ll(K)):NEXT
190 VDU23,230:FOR K=1 TO 8:V
DU(11(K)*&100)+rr(K)):NEXT
200 PRINT TAB(x+j-1,y)CHR$23
0;
210 NEXT
220 ENDPROC

```

Program V

```

160 b=8900:AX=10:XZ=b:YI=b D
IV &100:C$=CHR$(230)*CHR$(232)
+CHR$(10)+CHR$(8)+CHR$(8)+CHR$(
231)+CHR$(233)
170 FOR J=1 TO LEN(AS)
180 ?b=ASC(MIDS(AS,J,1)):CAL
L &FFF1
190 FOR K=1 TO 8:ll(K)=wide(
b?K DIV &10):rr(K)=wide(b?K MO
D &10):NEXT
200 VDU23,230:FOR K=1 TO 4:V
DUll(K):VDUll(K):NEXT
210 VDU23,231:FOR K=5 TO 8:V
DURr(K):VDUrr(K):NEXT
220 VDU23,232:FOR K=1 TO 4:V
DUrr(K):VDUrr(K):NEXT
230 VDU23,233:FOR K=5 TO 8:V
DURr(K):VDUrr(K):NEXT
240 PRINTTAB(x+(J*2)-2,y)C$
250 NEXT
260 ENDPROC

```

```

10 REM program VI
20 REM Vertical
30 MODE4
40 DIM over%(8)
50 PROCtwist("GOING UP",14,
20,-1)
60 PRINTTAB(16,18)"AND"
70 PROCtwist("GOING DOWN",2
0,11,0)
80 END
90 DEFPROCtwist(AS,x,y,up)
100 bX=8900:AX=10:XZ=b:YI=b
X DIV &100
110 FOR JX=1 TO LEN(AS)
120 ?bX=ASC(MIDS(AS,JX,1)):C
ALL &FFF1:IF up THEN PROcup EL
SE PROCdown
130 IF up PRINT TAB(x,y-JX)C
HR$224 ELSE PRINT TAB(x,y+JX)C
140 NEXT
150 LOCAL b,CS,J,K

```

```

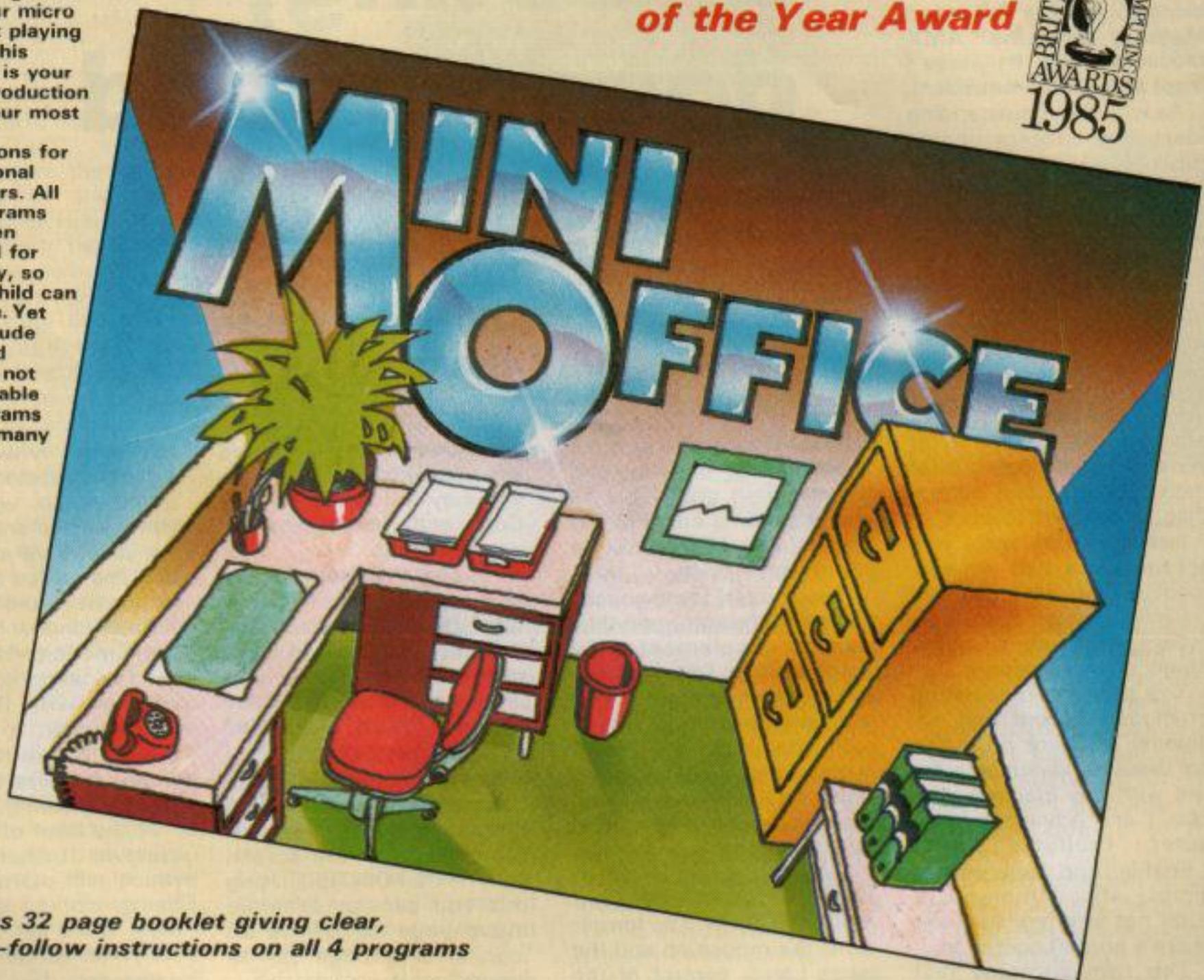
HR$224
140 NEXT
150 ENDPROC
160 DEFPROCdown
170 VDU23,224:FOR cX=1 TO 8:
colX=0:FOR kX=1 TO 8:over%(kX)
=(bX?kX)*2:bX?kX=over%(kX) MOD
&100:over%(kX)=(over%(kX) DIV
&100)*(2^(kX-1)):colX=colX+ov
er%(kX):NEXT:VDUcolX:NEXT
180 ENDPROC
190 DEFPROCup
200 VDU23,224:FOR cX=1 TO 8:
colX=0:FOR kX=1 TO 8:over%(kX)
=(bX?kX) MOD 2:bX?kX=(bX?kX) D
IV 2:over%(kX)=over%(kX)*(2^(8
-kX)):colX=colX+over%(kX):NEXT
210 ENDPROC

```

Program VI

If you want to start doing more with your micro than just playing games, this package is your ideal introduction to the four most popular applications for professional computers. All the programs have been designed for simplicity, so even a child can use them. Yet they include advanced features not yet available on programs costing many times as much!

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★ **Database**

★ **Spreadsheet**  
★ **Graphics**

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**TO ORDER TURN TO THE FORM ON PAGE 53**

WHEN the opportunity came to put the Advanced Memory Systems' AMX Mouse through its paces I leapt at it with enthusiasm.

As with most outstanding ideas, the concept behind this one is simple. You use the mouse to control the position of the cursor on the screen for a variety of different applications.

The mouse itself is a mechanical device which can be moved by one hand over a desk or any flat surface. It is a sort of liberated joystick fitting easily within the palm of your hand, although it is far more sensitive and natural than an ordinary joystick.

Inserted in its belly is a sensitive trak ball arrangement which, when rotated by rolling over a surface, moves the pointer or cursor to any screen position.

The package, consisting of mouse, a rom and additional software programs on cassette, is suitable for use with any Electron with Plus 1 and Advanced Computer Products' AP5.

Enabled and disabled by a simple star command, it does not interfere with the micro's normal operation.

The rom contains fast action machine code routines to create windows, icons and pointers on

# Directing, doodling and designing

**ALAN McLACHLAN puts an AMX mouse through its paces**

screen - icon is the term for a symbol or mini picture. When used creatively in menu options and the like they make programs far more user friendly.

There are 64 icons already stored in the rom, and they can be supplemented by using the Icon Designer program which is part of the software package.

In its simplest form without the use of any other software the mouse may be used instead of the normal cursor keys.

This is achieved by entering \*MOUSE ON and \*MCURSOR ON. The former turns the mouse on and the latter hands control of the cursor over to it.

The mouse has three fire buttons which can be pro-

grammed to simulate three separate keys. For example, you may choose the Return, Copy and Delete keys for use in editing.

Among the many useful commands in rom is \*WINDOW which incorporates windows in your programs. A pointer can also be implemented by typing in \*POINTER ON and \*SHOWPOINTER.

The first command initialises the pointer, the second displays it (it can be removed from the screen with \*HIDE POINTER). Using this you can for example move your pointer to an icon of a garbage can to "trash" a file.

The mouse really comes into its own when used with its accompanying software

packages. When Icon Designer is selected the screen displays six windows of various sizes and two icons - a disc drive and a waste bin. The screen format is as shown in Figure I.

Each window has a different function. The largest, used to design your icons, is labelled with the current icon number. To the right is a small window which shows the size of the icon you are creating.

At the base of the screen are two further windows which will store the icons being worked on. Uppermost is the current set and the lower contains an alternative set.

To alter an icon simply use the mouse to position the pointer over the

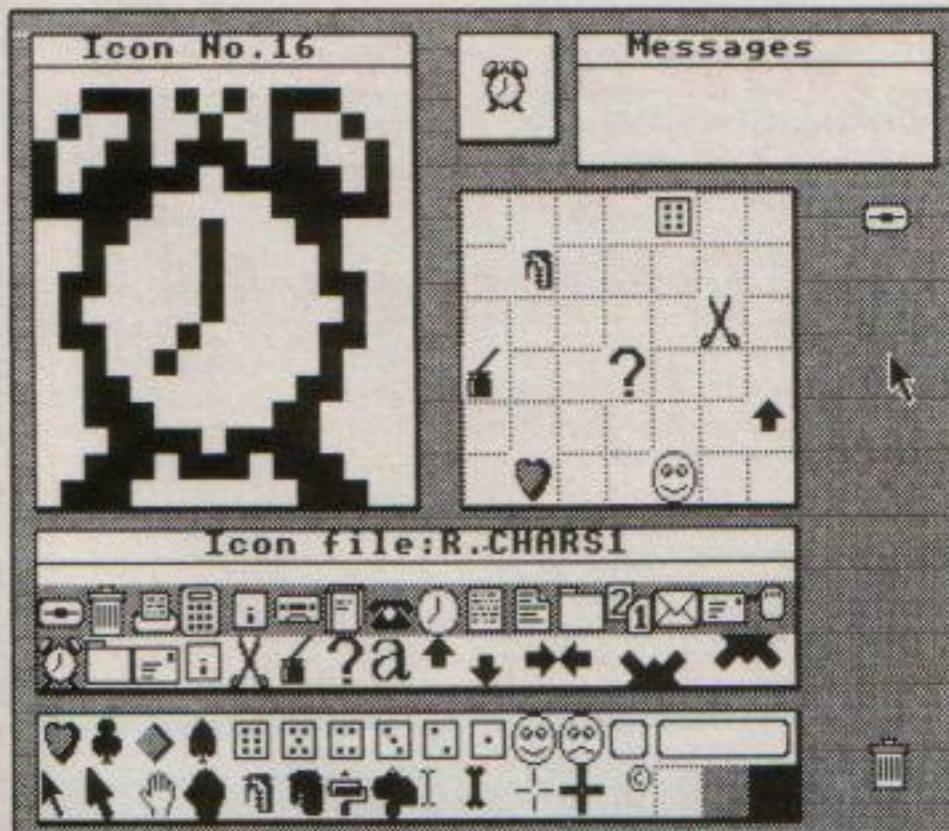


Figure I: The icon designer

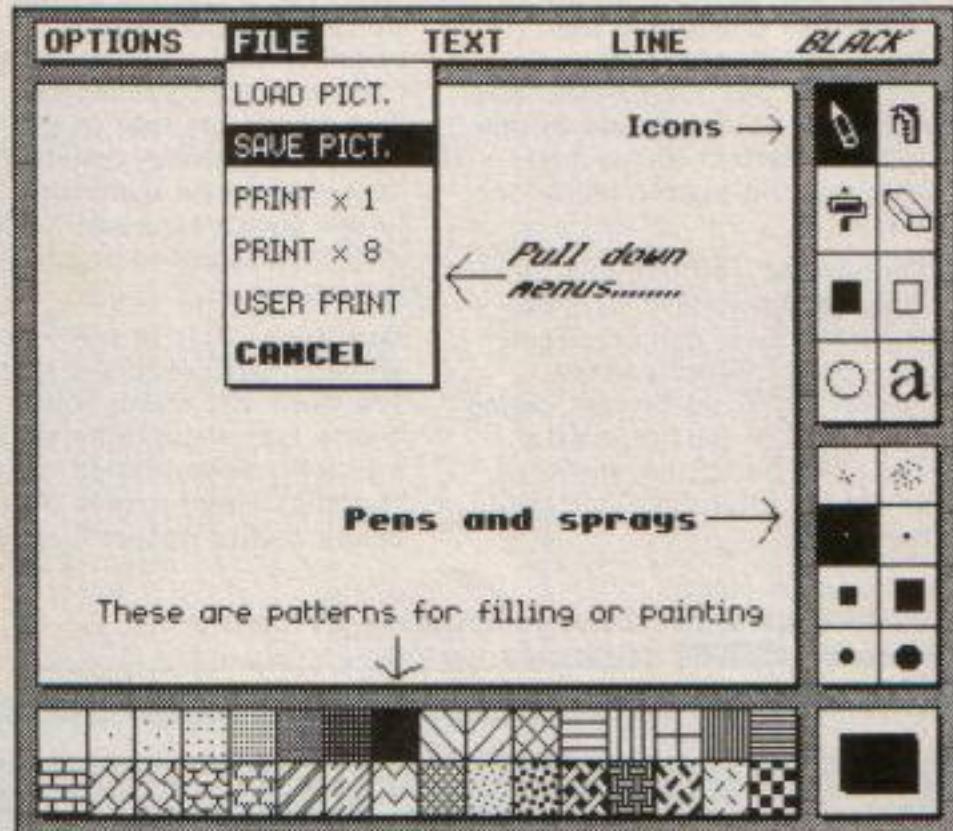


Figure II: The Art package

required icon in the lower window, hold down the "move" button and drag the icon across to the design window. There it is immediately displayed in an enlarged form labelled with its number.

If you move the pointer over any of the black squares which make up the icon and press the execute button, the colour of the square will be inverted.

The execute button toggles between black and white in this fashion to enable you to create your own icon as required.

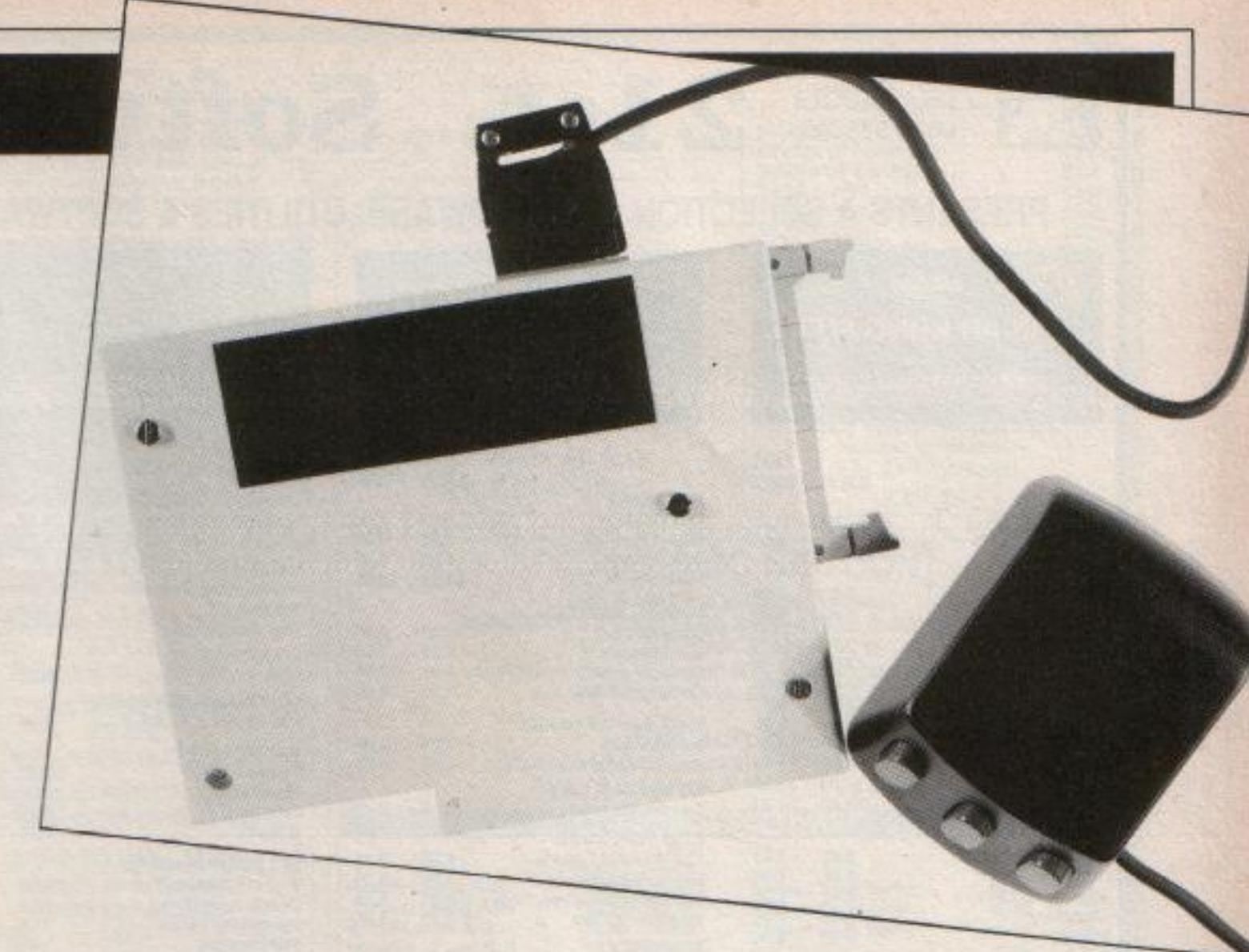
The program is in fact a very sophisticated character definer.

When you are satisfied with the character, you simply pick it up using the pointer again, and put it into the upper icon store where the new version will overwrite the old one.

To save the new set to disc simply move the pointer to the disc drive icon, press execute and use the prompt to "Save Icons".

You can, in fact, save as many sets of icons as you wish, taking care to save each under a different file name.

The software comes equipped with two sets of icons already and these can be loaded and manipulated to suit individual tastes.



The second item of software, Art Designer, is an advanced drawing program with a wide range of uses in the preparation of illustrations, and for technical drawing.

Even if you don't intend to use it for such serious applications you'll find this part of the package totally compulsive and incredible fun. I did, and so did my children - spending lots of time at the machine just doodling and painting.

Of course all commands are available on screen in the form of icons, which can be selected by means of the

mouse and its buttons. The screen displays a large drawing board (Figure III), surrounded by the full range of icons that will be used, and four menu options.

Drawing facilities include a Pencil with rubberbanding, a Spray with eight different nozzles and a Paint Roller with 32 on-screen patterns to choose from.

There is also an Eraser, a Box and Frame mode, a Circle, and six text styles, all chosen via the pointer.

An Options menu allows you to select Clear the picture, Fast or Slow mouse response, Serial or Parallel printer dumps, Tape or Disc filing and the facility to enter star commands.

The Text menu allows selection of three styles in normal or italic fonts, while the Line menu gives a choice of full, dotted, black, white or inverted. The menus themselves are quite natty. You pull them down rather like a roller blind, then having made your selection they roll up to reveal your original artwork underneath.

Despite the vast range of options, the program is simplicity itself and the user manual provided is virtually redundant. It is impossible to do the package justice in such a short review, so I've let the screen dumps speak for themselves.

Even though this device has obvious applications for technical drawing or filing systems, my family and I got a great deal of fun out of it just using it to create pictures and patterns which we saved for future viewing.

The sensitivity of the mouse itself accounted for the high quality of the artwork.

My only criticism of the whole package is the price - it is very expensive and can only be used with a Plus 5 and DFS. So it would cost Plus 3 owners around £150, though it's under £70 if you've already got a Plus 4 and 5. However, it is the most powerful and flexible hardware/software package available on the Electron and you won't find anything better.

All in all the mouse has become a permanent fixture in my micro (Editor please note). Simple yet powerful, this is the one product I've met where the computer cliche really is true: Its potential is only limited by your own imagination. ■

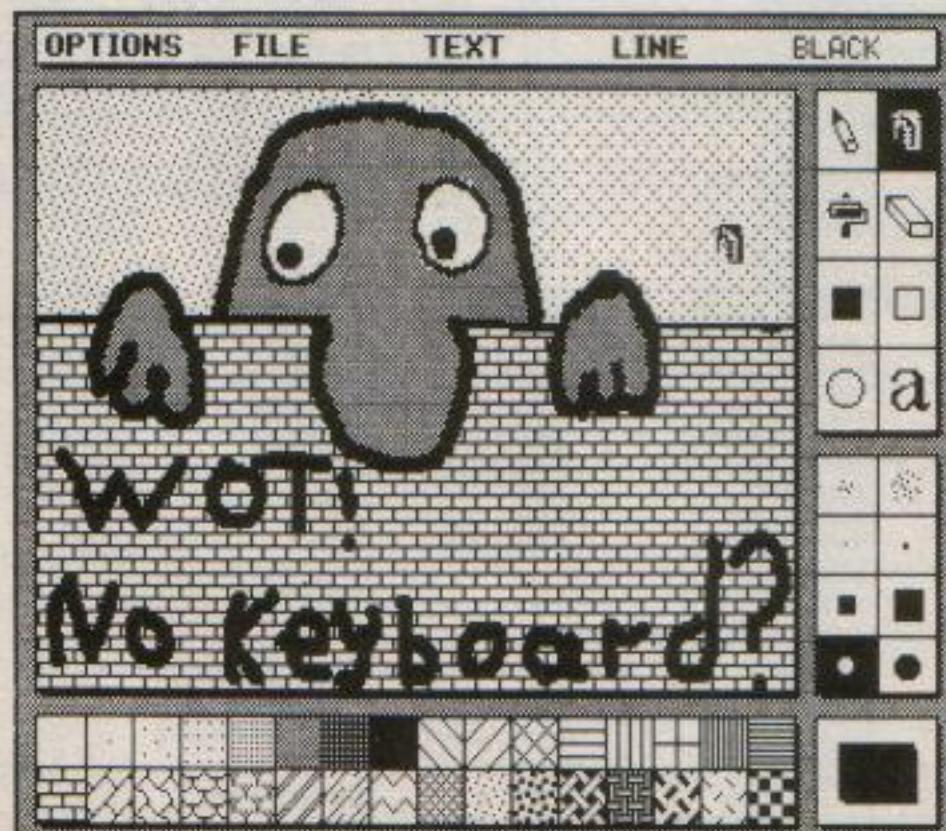


Figure III: Doodling with AMX Art

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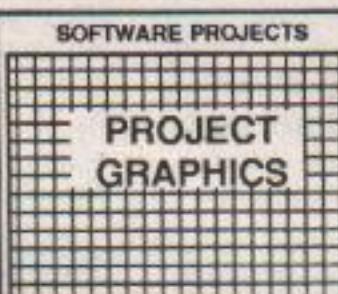
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LAST month we saw how the push button inputs of the Plus 1's analogue port could be used to provide information from a variety of different types of switch.

These digital inputs are all very well, but we've already learned that the real world is an analogue place. We need to somehow make the real world available to our 4 analogue input channels.

This month we'll start an examination of how we can do this. Let's begin with a summary of the characteristics of the Plus 1's analogue to digital converter inputs.

- The maximum input voltage is 1.8V and this returns a value from the ADC of 65280.
- The minimum input voltage is 0V, returning a value of 0 from the ADC.
- An analogue channel is read using `ADVAL(n)`, where  $n=1$  to 4.
- The ADC is an 8 bit device, but returns a 16 bit number, somewhere between 0 and 65280.

So the output returned from the ADC by `ADVAL(n)` goes up in steps by 256 each time.

It's often desirable to convert the result of an `ADVAL(n)` call into a value in the range 0 to 255 by:

**voltage=ADVAL(1) DIV 256**

- We can get a rough idea of the voltage applied to the input of the ADC. Clearly, if a voltage of 1.8V produces an output of 65280, and 0V gives a value of 0, an input of 0.9V should give a value returned from `ADVAL` of around 32640.

If we can get the par-

# Four channels to the analogue world

**Part IV of the Plus 1 series**  
**by JOE PRITCHARD**

meter in the real world converted into a voltage we can measure this parameter with our Electron. All we need to do is get that voltage generated.

There are two ways of doing this. The first is to use a transducer which generates a voltage dependant upon the physical parameter of interest.

For instance, a photovoltaic cell will convert light into voltage – the brighter the light, the higher the output voltage. These cells are used on spacecraft for generating electricity from sunlight.

The second method is to use a transducer to convert a voltage that we supply into one that depends upon

the parameter being measured.

We could use the VREF voltage of 1.8V from the Plus 1 as our input and measure the output on one of our ADC channels. This is shown in Figure I.

This month we'll look at this second method which depends upon something called a potential divider, which in turn depends upon resistors.

Resistors in one form or another are important in interfacing. They're cheap and widely available from any of the mail order companies specialising in electronic components.

For all our experiments, you'll need to stick to the values given as closely as

possible. As well as the resistance value the wattage also needs to be specified when you're buying resistors. You need  $\frac{1}{8}$  or  $\frac{1}{4}$  Watt devices.

The potential divider is a very useful circuit indeed, consisting of just two resistors – shown in Figure II. The input voltage  $V_{in}$  is always greater than  $V_{out}$ , the output voltage.

Voltage is sometimes called potential, hence the name potential divider – a circuit that divides an input potential by a given amount to produce a smaller output:

$$\text{Voltage out} = (\text{Voltage in}) \times (R_2/(R_1+R_2))$$

The output depends on the relative values of the

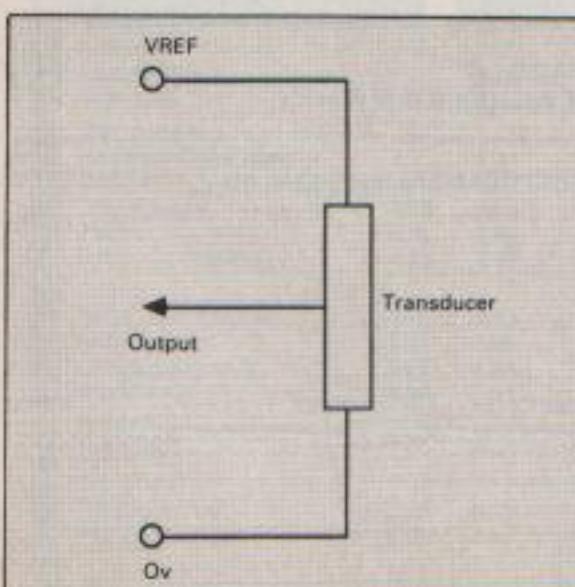


Figure I: A simple transducer circuit

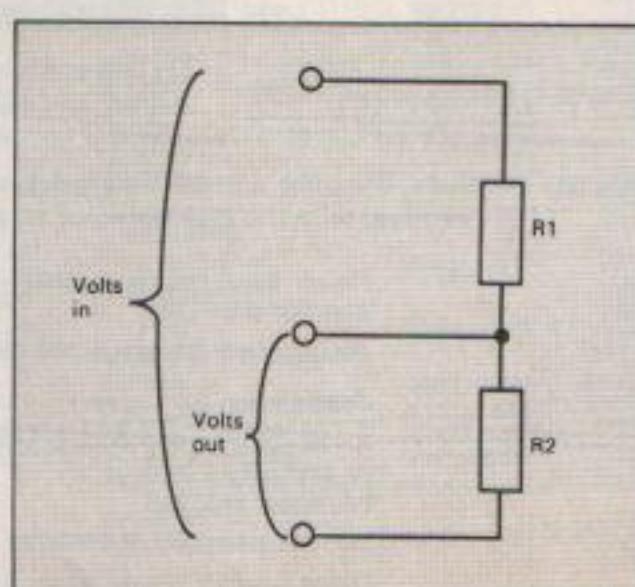


Figure II: A potential divider

two resistors. There's no need for us to go into the theory of all this. Just take it for granted that it's true.

However, our project this month is to prove this rule. We'll use VREF as our input voltage and measure the output voltage from the potential divider on channel 0 of the ADC using ADVAL(1).

You'll need several resistors: two 10k ones and one 6.8k, 3.3k, 2.2k and 1k. Note that in some places you'll see these values written as 3k3 or 2k2 and so on, these all mean the same thing - 3300 or 2200 ohms and so on.

You'll also need a D plug for the analogue port - you can use the same one you had last month - and a 3-way screw terminal block. Figure III shows how these components are to be wired up.

The screw terminal block is available from most electrical shops and no soldering is required.

When using VREF as a voltage source we say that the components between VREF and ground are the load on VREF.

The specifications for the Plus 1 require that there should be a minimum load of 10k for VREF.

Keeping R1 at 10,000 ohms will ensure that this criterion is satisfied, even if we have a low resistance for R2.

To alter the value of R2,

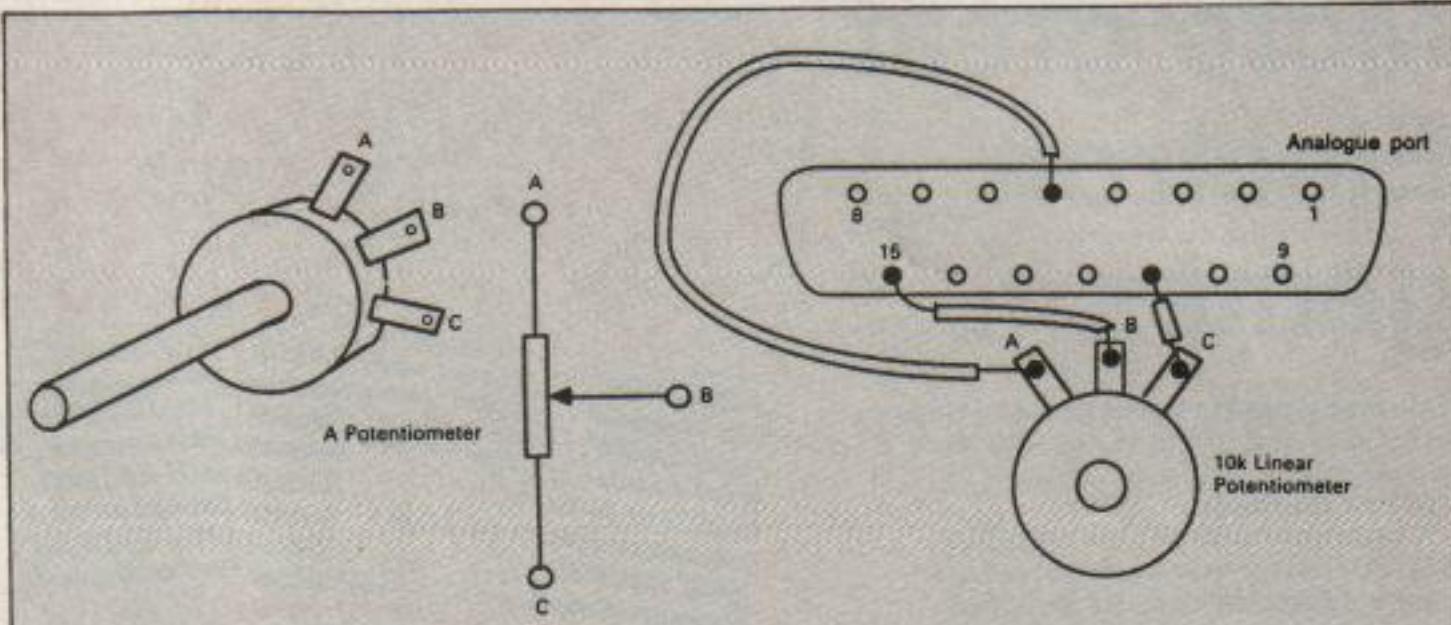


Figure IV: Using a linear potentiometer

remove it from the screw terminal block and replace it with a new value. I suggest you start at 10,000 ohms.

All we need now is the software. Enter and run Program I. It prompts you for the value of resistor you've chosen for R2, calculates what the voltage should be then measures the real voltage.

Note that the calculation of voltage is only approximate. Next month we'll see how we can calibrate the Plus 1's ADC to give a more accurate measurement.

The *scale* in line 40 gives us the size in volts for each of the 256 steps of the ADVAL output.

Line 90 uses the potential divider equation to calculate the voltage based on VREF equal to 1.8V.

Lines 100 to 140 read

ADVAL(1) 10 times calculating an average *inputvolts*.

Line 150 converts the value into the range 0 to 255 and finally into a voltage.

Run the program with different values of R2 and see how the potential divider alters VREF to give a different voltage at the input of channel 0.

So, we can vary the voltage produced by this circuit by altering the value of one resistor.

All we need to measure a physical parameter such as light or heat is to find a suitable transducer that converts it into a change in resistance.

Fortunately, this is fairly easy. There are a variety of transducers around and the simplest is probably the variable resistor, which converts the rotation of a

shaft into a change in resistance. This is shown in Figure IV.

The shaft rotates a sliding

```

10 REM Program I
20 REM Potential Divider Experiment
30 :
40 scale=1.8/255
50 :
60 REPEAT
70 CLS
80 INPUT "Value of R2 ",R2
90 PRINTTAB(2,10)"Calculate d voltage: ";1.8*(R2/(10000+R2))
100 inputvolts=0
110 FOR I%=1 TO 10
120 inputvolts=inputvolts+ADVAL(1)
130 NEXT I%
140 inputvolts=inputvolts/10
150 inputvolts=inputvolts/25
6
160 inputvolts=inputvolts*scale
170 PRINTTAB(2,12)"Actual voltage is about: ";inputvolts
180 PRINTTAB(2,20)"Press any key to go on"
190 *FX15,1
200 G=GET
210 UNTIL FALSE

```

Program I

```

10 REM Program II
20 REM Using a Variable
30 REM Resistor
40 :
50 REPEAT
60 input=ADVAL(1)
70 PRINTTAB(10,10);input/25
6;
80 UNTIL FALSE

```

Program II

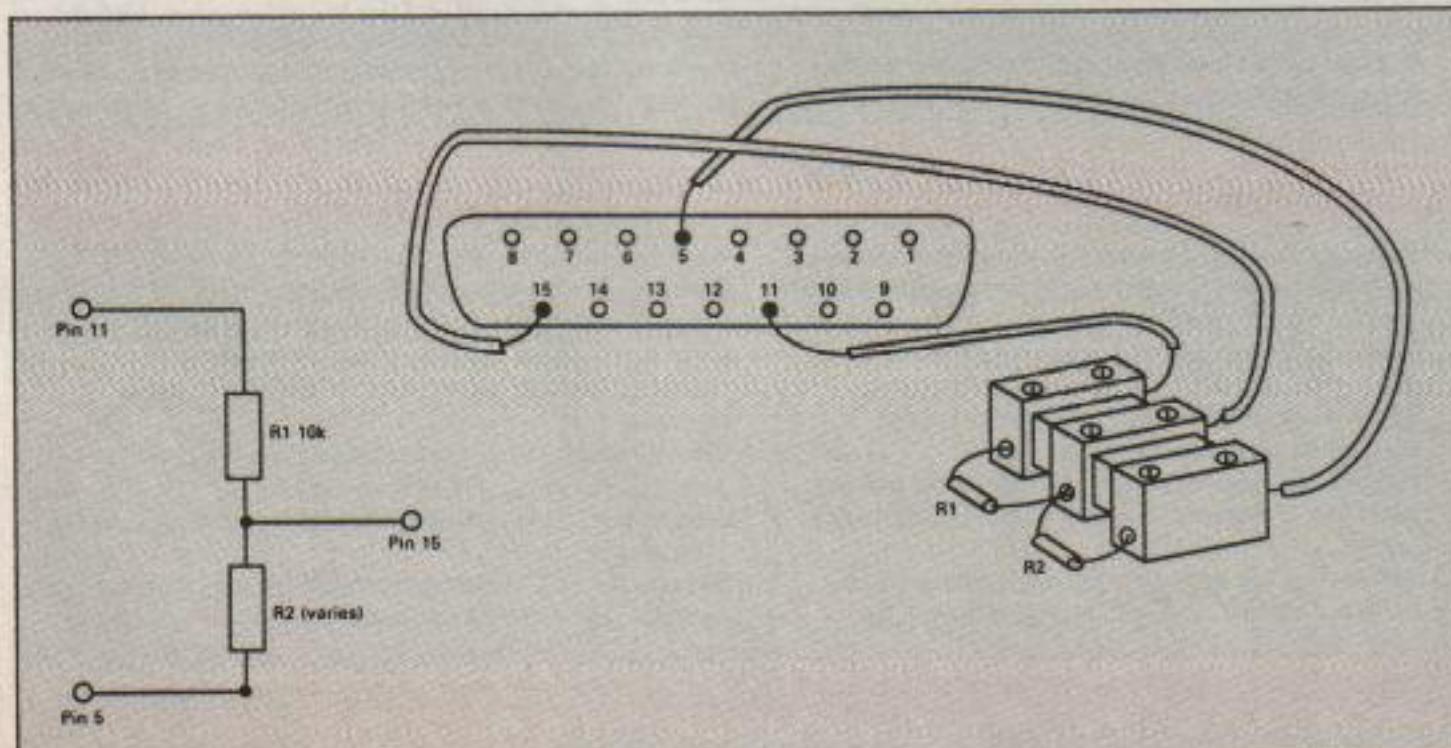


Figure III: Measuring the potential across R2

# More great Electron games

This month we introduce a new volume in our Ten of the Best series - 10 more games to give you many hours of fun and entertainment.

These four packages are crammed with the best games from the last two years of Electron User. As an added bonus a previously unpublished game has been added to each one - stunning machine code masterpieces from our technical wizard, Roland Waddilove.

So give yourself a treat... with the most popular games compilations we've ever produced.



## Volume 1

**Jam Butty:** Machine code simulation of high drama on a building site.  
**Golf:** Play a round by yourself, or play against your pals.  
**Haunted House:** Fight against all the odds to get out alive.  
**Space Hike:** Another classic. Help the spaceman avoid marauding monsters.  
**Parky's Peril:** Help Parky through an invisible maze, racing against time.

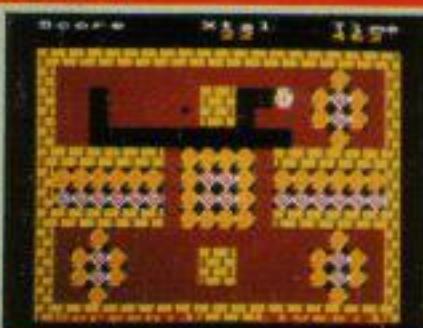
**Rally Driver:** All the thrills of high-speed driving with none of the risks.  
**Alphaswap:** Your letters are in a twist. Can you put them in order.  
**Knockout:** Fast and furious action as you batter down a brick wall.  
**Money Maze:** Avoid ghosts and collect coins in an all-action arcade classic.  
**Lunar Lander:** The traditional computer game specially written for the Electron.

## Volume 2

**Atom Smash:** Machine code thrills as you help to save the world from destruction.  
**Bunny Blitz:** Go egg collecting, but keep away from proliferating rabbits.  
**Castles of Sand:** Build castles - but beware the rising tide and hungry sandworms.  
**Reaction Timer:** Test your reactions with this traffic lights simulation.  
**Solitaire:** The Electron version of the age-old game.

of logic and patience.  
**Jumper:** Jump for your life in this exciting arcade action game.  
**Break free:** Test your wits and reflexes in this popular classic ball game.  
**Code breaker:** Crack the code in a colourful if frustrating brainteaser.  
**Parachute:** Save the plunging sky divers from a watery end.  
**Star fighter:** Attack the bandit ships in this fast-moving 3D punch up.

## Volume 3



**Rockfall:** Come diamond mining in this fun packed game with its own screen designer.  
**Karate Warrior:** Win your black belt in this gruelling test of karate skill.  
**Grand Prix:** Battle your way into the lead in this tricky racing simulation.  
**Invasion Force:** Can you survive wave after wave of relentlessly advancing aliens.  
**Grebit:** Guide the frog across the busy road then across the fast-flowing river!

**Fruit Worm:** Steer the worm towards the fruit while avoiding rocks and its ever-growing tail.  
**Manic Mole:** Watch out for melting platforms and conveyor belts in your quest for jewels.  
**Skramble:** Fly your fighter fast and low over the landscape to penetrate enemy territory.  
**Mr. Freeze:** You'll need speed and strategy to reach the ice blocks before they melt away.  
**Paint Roller:** Steer a speeding roller, run over paint pots but keep clear of the rocks.

## Volume 4



**Lunar Invasion:** Defend the moon from wave after wave of marauding aliens in this superb multi-screen arcade game.  
**Howzat:** Try not to get caught out in this vivid recreation of a day's test cricket.  
**Snapdragon:** Enjoy this two-player micro version of the familiar card game.  
**Day at the Races:** Fancy a flutter? You can bet your shirt in safety in this two-player horse racing game.  
**Reversi:** Combine cunning and chance as you try to out-think your Electron at this classic

board game.  
**Fishing:** Relax and enjoy a quiet afternoon by a shady brook. You'll regret if you let this one get away.  
**Cavern Capers:** Escape from the depths of the planet by blasting oil drums and dodging deadly fireballs.  
**Craal:** Escape from the maze and win the beautiful princess in this superb text adventure.  
**Oxo:** High strategy meets low cunning in a logic game to strain your brain.  
**Missile Attack:** Defend your city from a missile invasion and save it from certain doom.

NEW

**TO ORDER TURN TO THE FORM ON PAGE 53**

## From Page 27

arm across a track of resistive material, such as carbon. This alters the amount of track, and hence the resistance, between A and B and B and C. The resistance between A and C stays the same.

It's like a potential divider, with the A-B resistance forming R1 and the B-C resistance forming R2. For our experiments, you'll need a 10k linear potentiometer.

A potentiometer is simply a variable resistor. The linear part of the name refers to the way in which the resistance changes as the slider moves across the track.

A 10 degree rotation at one end of the track will cause the same resistance change as a 10 degree rotation at the other end.

With logarithmic potentiometers the change in resistance for identical amounts of shaft rotation is different at different points on the track.

The simplest way to connect the potentiometer is shown in Figure IV. Use a 10k potentiometer.

Enter and run Program II. This reads a value from ADVAL(1) and prints the result. By rotating the shaft you should be able to get all values between 0 and 255.

Figure V shows a simple games paddle you can build. It can be read with ADVAL(1), and ADVAL(0) can be used to find out when the button is pressed.

The button and potentiometer can be mounted in a plastic box and 5 core ribbon cable can be used to connect it to a D plug.

When you mount the controls in a box you'll need to cut the potentiometer shaft down. The switch should be a push to make, release to break type.

● That's all for now. Next month we'll look at special resistors whose values depend upon light and heat.

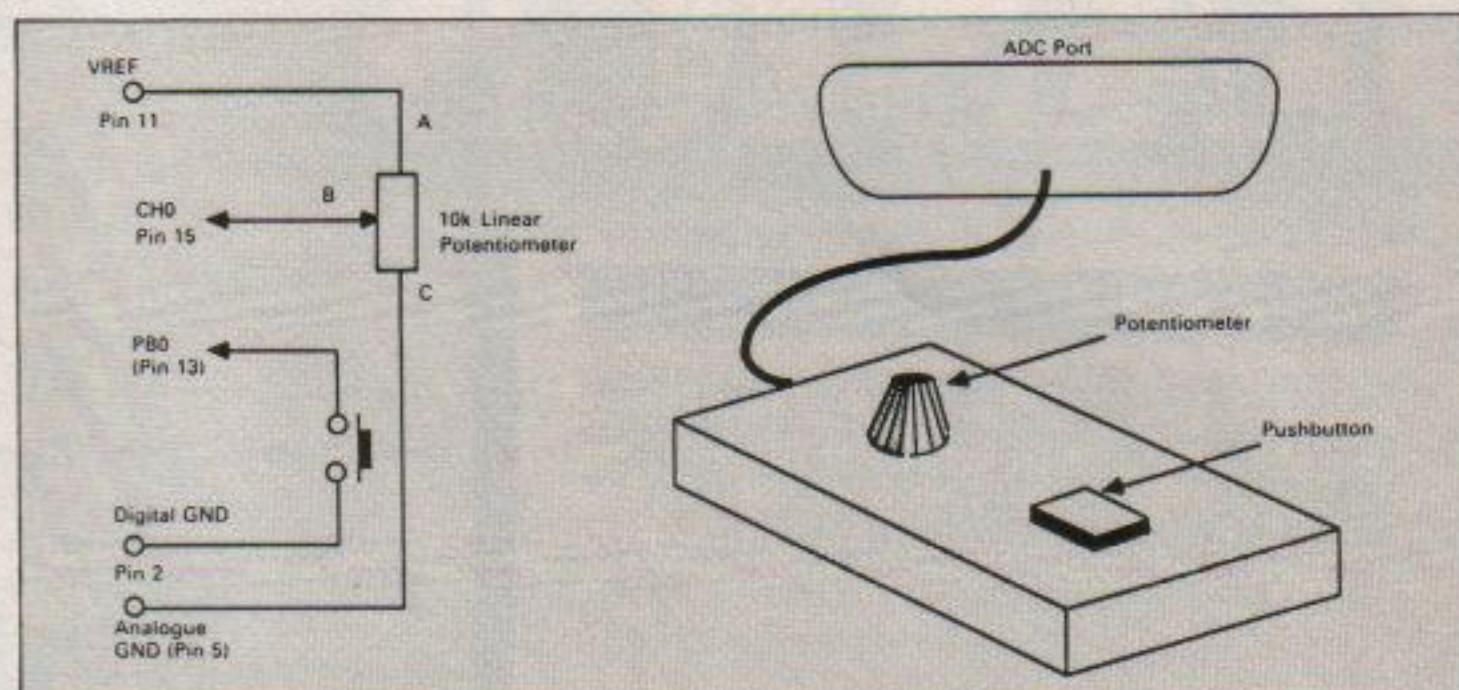


Figure V: Building a games paddle

## RESISTORS

A resistor is an electronic component which, when a voltage is applied across it, limits the amount of current flowing through it.

This is very useful in electronic equipment as it allows us to generate many different voltages and currents from a single voltage.

The amount of current flowing through a resistor is given by:

$$\text{current} = \text{volts}/\text{resistance}$$

$$I = V/R$$

The current is measured in Amps, the voltage in Volts and the resistance in Ohms. If you know two of the parameters you can calculate the third by rearranging the equation above:

$$V = I \cdot R$$

$$R = V/I$$

$$I = V/R$$

In modern electronics we often need large resistors in the thousands of Ohms range.

The symbol k stands for 1000 ohms so a 10,000 ohm resistor is often written as 10k and a 3,300 ohm resistor is written as 3.3k or 3k3.

The value of a resistor is not written on the side, but is coded in the stripes. This is shown in Figure VI.

Suppose we've got a resistor with stripes of red, violet, red and silver. This would be 2, 7, 2 zeroes and 10 per cent tolerance - 2k7 or 2700 ohms.

The tolerance indicates the percentage accuracy so the resistor will be 2700 ohms plus or minus 270 ohms. It could be anywhere between 2430 ohms and 2970 ohms.

Finally, resistors have a wattage. Current passing

through a resistor generates heat and the more current, the more heat produced.

The wattage indicates the amount of heat that a resistor can get rid of before going phut.

As we're dealing with small currents, we needn't worry too much about this, so 1/4 watt resistors will be fine.

When soldering resistors you may need to scrape grease off the leads of the resistor. You can use a hard pencil rubber or gently scrape the wires with a knife.

Go easy on the soldering as too much heat can change the value of resistance. However, it would be difficult to change the resistance sufficiently to affect our experiments.

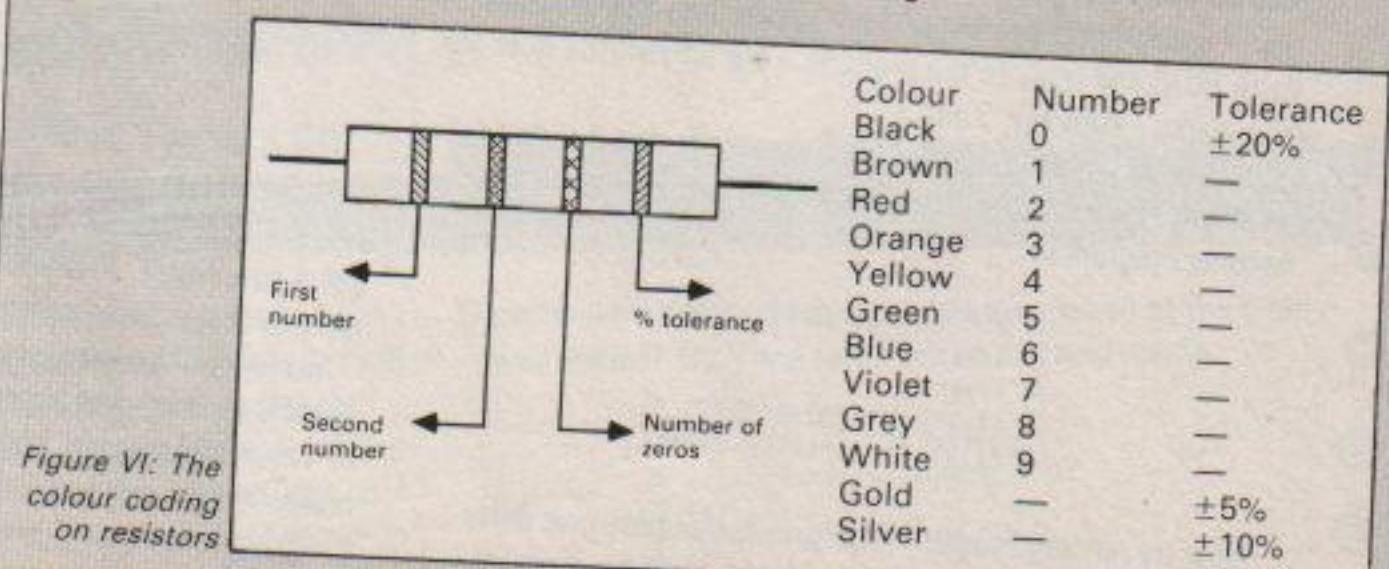


Figure VI: The colour coding on resistors

# BACK TO BASICS

Part eight of  
TREVOR ROBERTS'  
down-to-earth series

## Getting into programs

THE last bit of Basics had us pondering over Program I – last month's Program VII – which contains a previously unseen keyword, INPUT. Let's go through the program line by line, seeing what happens as the micro does the same.

```
10 REM Program I
20 INPUT length
30 INPUT breadth
40 area=length*breadth
50 PRINT "The area is ";area
```

Line 10 just identifies the program as Program I, using a REM statement to do so. Remember that everything in a line following a REM is ignored.

The next line contains our first INPUT. This tells the Electron to look at the keyboard, take the number we type in, and store its value in the variable *length*. In effect it performs:

look at the keyboard  
note the number written there  
store this in the variable after INPUT

or:

get some keyboard input  
LET the following variable hold this input

All we see of this process is a forlorn little question mark, the input prompt. This reminds us to type in a value and press Return to send it from the keyboard into the computer.

One thing about INPUT is that it takes charge of things. The program won't go any further unless and until you satisfy the demand for input. As soon as this is done, Program I proceeds to line 30 and hits another INPUT.

This time the keyboard input is placed in the variable *breadth*. The final two lines just multiply *length* and *breadth*, storing the result in *area* and displaying this result.

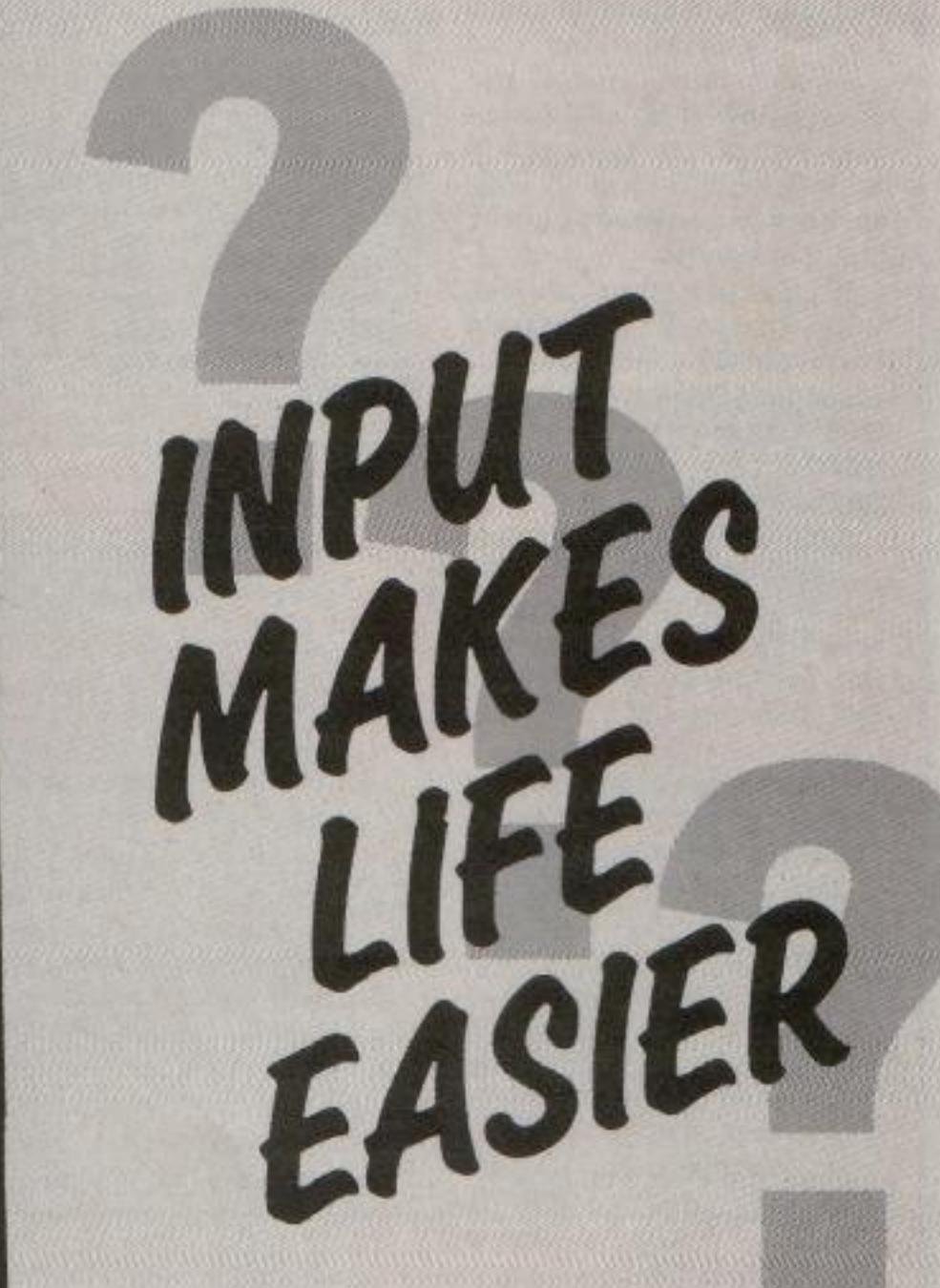
## Do it over again

IF that were all there was to Program I and INPUT, then it wouldn't be very impressive. However, there's a lot more to it than might seem apparent at first glance. Run the program (with RUN) and reply to the prompts – our lonely little question marks – with say, 3 and 2.

From what we've said before, you should see that 3 ends up in *length* while *breadth* becomes 2. In effect, Program I has become Program II.

```
10 REM Program II
20 length=3
30 breadth=2
40 area=length*breadth
50 PRINT "The area is ";area
```

Now try running Program I again, only this time give different answers to the prompts, say 20 and 15. Now Program I does the same job as Program III. Yet we've only run one



program, Program I.

```
10 REM Program III
20 length=20
30 breadth=15
40 area=length*breadth
50 PRINT "The area is ";area
```

This is the joy of input. It allows the same program to be run over and over again using different values of *length* and *breadth* each time. The same program processes fresh data to get a new result. And you don't have to alter the lines, just reply to the prompts as necessary.

Instead of the program just calculating the area of one specific rectangle, as happens in Programs II and III, the area of any rectangle can be calculated. In other words INPUT makes the program general. Also the user decides what the program does as it runs, rather than the programmer beforehand.

## Strings and input

SO far we've just used INPUT to take numbers from the keyboard and store them in numeric variables – the ones without the \$ sign at the end of their names. Program IV shows how INPUT can be used to take a string from the keyboard and store it in a string variable.

```
10 REM Program IV
20 INPUT name$
30 PRINT "Hello " name$.
```

What happens is that line 20 has the program waiting for keyboard input, the solitary question mark telling you that the micro wants your attention. Whatever you type in now – hopefully your name – will be put into the string variable name\$. The last line prints a friendly greeting.

Although this example is fairly trivial, you'll find that INPUT is used a lot in serious programming. And often it is used to find out a name so the program can do things like search out your address or credit rating. Program V uses two INPUTs to discover your full name.

```
10 REM Program V
20 space$=" "
30 INPUT firstName$
40 INPUT surName$
50 fullName$=firstName$+space$+surName$
60 PRINT "Hello" space$ fullName$
```

Here I would type in Trevor in answer to the first question mark and Roberts to the second. Hence firstName\$ would hold Trevor while surName\$ would contain Roberts. Line 50 concatenates these, using space\$ to make things more legible when the last line displays the message. Try omitting space\$ and see what happens to the output.

Readers of an observant and inquiring nature may have wondered why I didn't just INPUT the lot into fullName\$ in the first place. The answer is that it's more flexible to hold them this way. I can have a program address a letter to Mr. Roberts:

```
"Mr. " + surName$
```

and start it with "Dear Trevor":

```
"Dear " + firstName$
```

When the full name is required it can always be constructed from its components.

## Input in a twist

BY now Program VIII should hold no fears for you, and I won't insult your intelligence by trying to explain it. However I will set you a few problems to keep you busy until next month.

What happens if you just hit Return at the prompt, without typing anything in? Is it the same for both strings and numerics? And what happens if you get your input mixed up

### Prompt action

WHILE I've been waxing lyrical about how useful INPUT is, I must admit to one irritating aspect of the command. This is its use of question marks as prompts. They're not very informative, are they?

In Program V we had two of them. The first wanted the user's first name while the second wanted the surname. The trouble is there's no way of telling which is which, as both are prompted for by a question mark.

Suppose that the program wanted them in the reverse order sometimes used for names? This would have my name as Roberts, Trevor. Yet how could I tell from the program. In fact, how do I know that it is my name it wants?

It's easy to see that unless you know its workings, Program V is all but useless. You have to guess what the question marks mean. A much better way of doing things is to use the PRINT command to give the user more meaningful prompts. Program VI shows this being done.

```
10 REM Program VI
20 space$=" "
30 PRINT "Please enter your first name"
40 INPUT firstName$
50 PRINT "Please enter your last name"
60 INPUT surName$
70 fullName$=firstName$+space$+surName$
80 PRINT "Hello" space$ fullName$
```

Now lines 30 and 50 spell out what's required by way of input. Try out Programs V and VI on people who know nothing about programming and you'll find that Program VI is the one they can use. Mind you, they may need an extra PRINT reminding them to press Return.

This combination of INPUT with a printed, more explicit prompt is so useful that those awfully clever people at Acorn have put it in their Basic.

Instead of using a separate PRINT statement you can put your message between the INPUT and the variable that's to hold whatever you reply to the prompt. Program VII illustrates this.

```
10 REM Program VII
20 space$=" "
30 INPUT "Please enter your first name" firstName$
40 INPUT "Please enter your last name" surName$
50 fullName$=firstName$+space$+surName$
60 PRINT "Hello" space$ fullName$
```

Notice that the question marks have disappeared. You can always get them back by inserting a comma between the message and the variable used to hold the input.

and enter a string where a number is expected or the other way around? Try it and see. More on this next month.

```
10 REM Program VIII
20 INPUT "String" anyString$
30 INPUT "Numeric" anyNumber
40 PRINT "The string is " anyString$
50 PRINT "The number is " ; anyNumber
```

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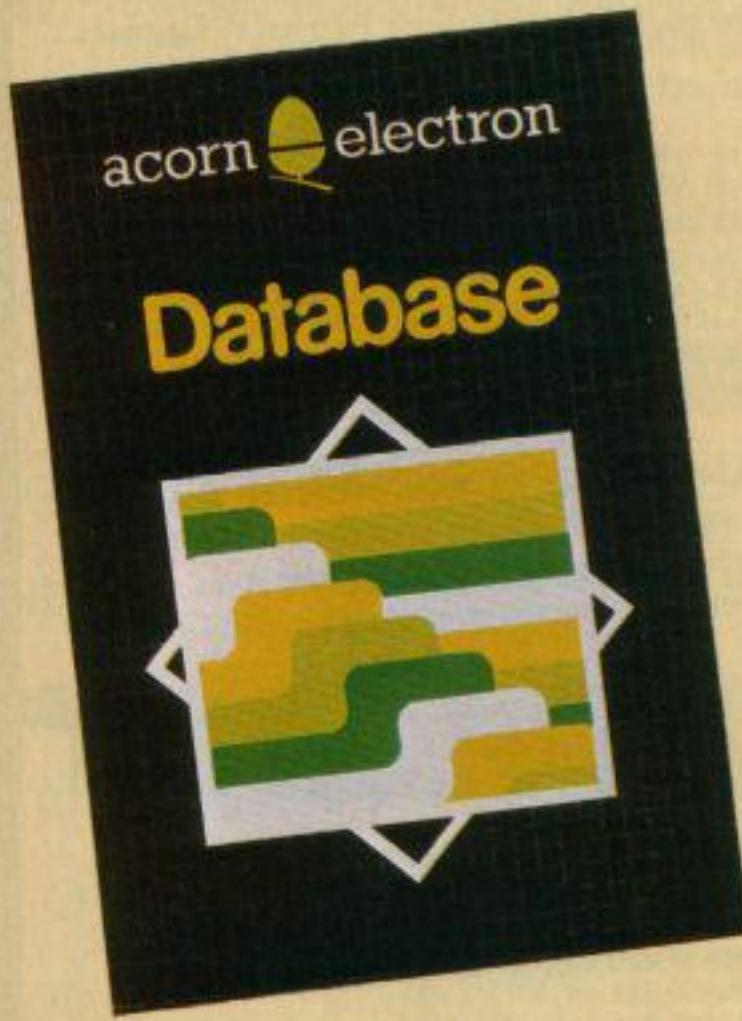
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*Will only run with the Electron Plus 3*

**TO ORDER TURN TO THE FORM ON PAGE 53**

DRAGON'S Doom is a fun, educational game for children. It's bright and cheerful with an interesting screen display showing a battle between a knight in shining armour and a fierce dragon.

It is designed to test and improve children's ability to read an ordinary analogue clock and tell the time.

Long ago a thief gained entry to the king's strong-room and took the royal crown jewels.

And although he was caught in the market the following day, there was no sign of the jewels and the thief would not speak.

So it's up to you, cast in the role of a mediaeval knight, to recover your king's lost treasure.

After travelling for many days you discover them at the back of a large cave.

However, just as you approach the mouth of the cave a large dragon appears out of the gloom barring your way.

You must fight and drive away the dragon to reach the jewels. This is achieved by answering a series of questions as fast as possible.

A large clock is drawn in the bottom right corner of the screen and on the left is the time written in four different ways.

Three of them are wrong and one is right – you have to decide which is the correct one.

For instance, is it five to twelve, 11 o'clock or 12:55?

Use the up and down cursor keys to highlight the correct time then press Return when you are sure.

Don't take too long deciding as there is a time limit, and if the second hand on the clock completes one sweep of the clockface you forfeit your go.

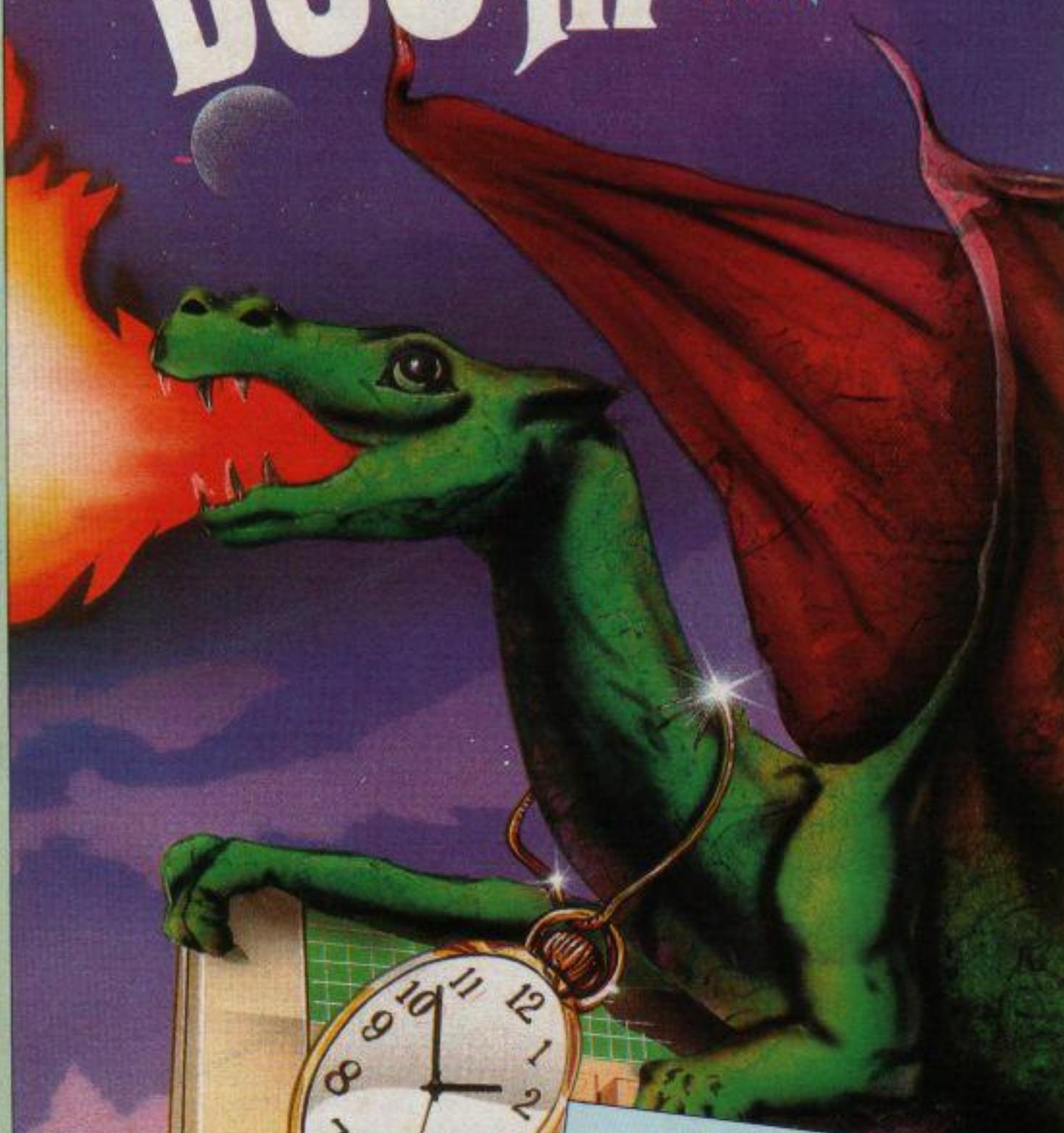
If your answer is correct you will move towards the dragon, eventually driving it away with your sword.

However, if you answer incorrectly three times the dragon will rush out of the cave and gobble you up.

Good luck in your quest for the treasure – and watch out for that dragon.

# DRAGON'S DOOM

By ANDREW  
and STEPHEN  
WEIR



## CONTROLS

Cursor up = Move highlight up.  
Cursor down = Move highlight down.  
Return = Confirm answer.

## VARIABLES

name\$ Your name.  
level% Difficulty level.  
SC% Your score.  
right% The correct answer.

## PROCEDURES

assemble Assemble the machine code.  
man Print the man.  
diamond Print the diamonds.  
question Print the question.  
high Print the high score table.  
bench Set up the screen.

Full listing starts  
on Page 35



The most adventurous and original way  
to test your French ever devised.

# FRENCH on the RUN!



£9.95  
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## The adventure game with a big difference.

You're on  
your own in  
Occupied  
France —  
facing the  
toughest test  
that a British  
pilot has  
ever had to  
experience!

The year is 1943. As an RAF officer stranded in Occupied France you have one aim — to get back to Britain.

The only way to do this is to try to pass as a Frenchman, but if your French isn't good enough you risk capture and interrogation by the police or even the Gestapo.

Even the simplest tasks — from buying food to taking buses — place you at risk. And to add to your problems you've got limited funds: "Should I hitch a lift or take the train?", "Do I sell my belongings or get a job?"

Whatever you decide to do, time is short. And there are always people willing to denounce you ...

French on the Run is that rare combination: A truly educational program that's also a thoroughly enjoyable game. This text adventure not only tests your grammar and vocabulary, but your knowledge of France and the French way of life.

And as your French improves the language problems get harder and the situations become progressively more dangerous. There are four routes to complete in sequence — you need the password from the last before attempting the next. The standard of French required is about O level, though on the last route it rises to just below A level.

And there's a chance for you to try out the French you'll learn in practice: We are offering a FREE WEEKEND IN PARIS as a prize to the first person to get back to England alive, having broken a code near the end of the final route.

**For teachers:** French on the Run uses multi-choice questions with randomised distractors, all carefully chosen to illustrate linguistic points or points concerning things French. The program is meant for individual assessment, but can be used just as effectively for classroom work. A sealed envelope contains details of how the secret passwords are created.

DATABASE SOFTWARE

TO ORDER TURN TO THE FORM ON PAGE 53

### ***Dragon's Doom listing***

**From Page 33**

## Dragon's Doom

John

## Level 1



12:55 PM  
5 to 1  
1255 hours  
11:00 PM



```

1,1,1,1,1,0,0,0,0,0,0,17,17,48
,24,0,16,0,255,241,17,241
260 DATA241,113,17,17,1,17,1
7,58,50,50,116,36,14,284,238,1
02,228,100,198,196,236,254,253
,254,253,253,254,237,14,240,24
2,178,116,116,116,36,14
270 REM Diamond
280 DATA17,51,118,255,118,51
,16,0,128,200,224,200,128,0
290 REM Dragon
300 DATA 0,0,0,0,0,0,0,0,16,
1,48,33,67,37,67,7,67,135,15,7
5,135,15,165,15,67,37,67,18,33
,48,33,67,67,7,135,165,67,67,3
3,0,0,0,0,0,1,22,165,15,75,1
4,12,12,8,8,17,51,51,17,17,8,8
,8,8
310 DATA 12,8,224,98,165,15,
15,9,6,7,11,12,45,15,15,67,0,0
,0,0,0,180,15,15,15,8,0,0,0,0,
0,0,153,247,242,248,252,252,11
8,119,54,55,23,31,151,105,30,1
4,28,33,67,165,15,135,15,15
320 DATA 64,100,115,112,125,
60,60,60,48,16,16,0,0,34,119,2
55,250,250,250,242,242,242,242
,242,243,241,241,241,248,248,2
29,45,15,15,15,15,15,15,15,12,
0,0,0,196,232,192,192,128,128,
0,0,0,0,0,204,247,245,245,24
4,244,246,242,242
330 DATA 243,241,241,249,249
,120,150,15,15,15,15,15,15,15,
8,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
17,51,255,253,249,241,241,241,
243,242,242,242,242,242,227,21
8,173,143,15
340 DATA 15,15,15,15,15,0,0,
0,33,33,33,1,16,16,16,0,0,0,0
,0,0,0,136,204,230,241,224,226,
192,196,128,152,97,135,15,135,
15,15,9,6
350 DATA 15,15,15,15,15,15,15,7
,0,12,14,207,139,15,15,14,135,
135,67,67,7,33,33,1,16,16,33,3
3,7,67,15,135,15,15,15,15,15,1
5,15,15,15,112,8,12,15,15,15,1
5,15,0,7,15,15,48,42,0,81
360 DATA 30,15,15,72,14,30,4
5,15,30,45,15,15,30,15,15,15,3
0,15,15,30,15,44,104,129,7,15,
0,0,14,15,15,15,0,15,13,14,160
,170,0,85,80,15,12,8,0,0,0,128
,12,12,44,194,14,14,14,104,192
,12,72,128,8,0,0,12,14,10,0,0
,0,8,15,13
370 DEF PROCmain_program REP
EAT name$=FNname:Level%=1:PROC
bench:REPEAT PROCinit:REPEAT P
ROCquestion:correct%=FNget_ans
wer:IF correct%<0 PROCright EL
SE PROCwrong
380 PROChands(time%):UNTIL l
ives%>0 OR dragon%>FALSE:IFdra
gon%>0PROCwin ELSE PROCclose
390 UNTILFNanother=FALSE:PRO
Chigh:UNTILFALSE
400 DEFPROCbig(AS$):FORCH%>1T
OLENAS:AI=ASC(MIDS(AS,CH%,1)):CA
LLd:NEXT:ENDPROC
410 DEF FNname CLS:PROCspeed
on
420 RESTORE:VDU31,4,3,17,3:P
ROClarge('DRAGON'S DOOM'):VDU3
1,5,10,17,2:PROCbig('What is y
our'):VDU31,8,13:PROCbig('name
?'):COLOUR3:PRINTTAB(0,27)'RET
URN '':COLOUR2:PRINT'when fini
shed':COLOUR3:PRINT'DELETE ';
430 COLOUR2:PRINT'to correct
''' a mistake':;VDU17,1,
31,2,19,152,31,17,19,153,31,2,
23,154,31,17,23,155,31,2,20,1
0,8,10,150,8,10,150,31,17,20,1
51,8,10,151,8,10,151:PRINTTAB(
3,19):STRINGS(14,CHR$149):TAB(
3,23):STRINGS(14,CHR$149);
440 PRINTTAB(3,7):STRING$(15
,CHR$149):COLOUR3:n$=":PRINTT
AB(4,21):*:fx 15,1
450 PROCspeedoff:RESTORE180:
REPEAT PROCtune(1):key%=INKEY(
0):IF key%>31 AND key%<127 AND
POS<16 VDUkey%:n$=n$+CHR$(key
%)
460 IF key%>127 AND LENn$ n$=
LEFT$(n$,LENn$-1):IF POS>3 VD
Ukey%
470 UNTIL key%>13:FX21,5
480 mistakes%>0:SC%>0:Fn$=
'n$="Lazy"
490 =n$ 
500 DEF PROCtune(V%):READ pi
x:IF pi%<0 RESTORE180:READpix
ELSE IF pi%>0 SOUND1,0,0,1 ELSE
SOUND1,V%,pix%,2
510 ENDPROC
520 DEF PROCbench CLS:PROCsp
eedon:VDU17,3,31,4,2:PROCbig(
'Dragon's Doom'):VDU17,2,31,0,5
:PRINTname$:VDU17,1,31,13,5:PR
INT'Level':VDU5,18,181,1:MOVEB
,380:PRINTSTRING$(20,CHR$149):
MOVEB,412

```

### ***Dragon's Doom listing***

### **From Page 35**

```

530 VDU140,142,13,11,140,13,
11,140,13,11,140,13,11,140,143
,13,11,140,140,143,13,11,140,140,1
40,140,140,143,13,11,140,140,140,1
40,140,140,146,13,11,140,140,140,1
40,140,142,13,11,140,140,142,1
3,11,140,142,13,11,142
540 MOVE32,636:GCOL0,0:PRINT
'Den':PROCspeedoff:VDU19,3,7;0
;0:ENDPROC
550 DEF PROCclock VDU26,18,0
,3:MOVE1120,310:FORI%=&T0360$T
EP20:DRAW1120+$IN(RAD(I%))*160
,160+COS(RAD(I%))*150:NEXT
560 FORI%=&T0330$STEP30:MOVE1
120+$IN(RAD(I%))*160,160+COS(R
AD(I%))*150:DRAW1120+$IN(RAD(I
%))*140,160+COS(RAD(I%))*130:N
EXT
570 VDU5:GCOL0,2:MOVE1108,28
0:VDU230:MOVE1220,170:VDU231:M
OVE1108,56:VDU232:MOVE990,170:
VDU233:ENDPROC
580 DEF PROCdiamonds RESTORE
590:FORI%=1T05:READaddress:!&8
6=address:CALLdiamond:NEXT:END
PROC
590 DATA&6D5C,&6EA2,&6E92,&6
FE8,&6FD8
600 DEF PROCman !&80=manx%:C
ALLman:ENDPROC
610 DEF PROCinit lives%&3:dr
agon%&TRUE:manx%&6E58:PROCman
:VDU26,5,18,181,1:MOVE1160,860
:VDU32,127:PRINT;Level%:-!&82-
&6AF8:CALLdragon:PROCdiamonds:
PROCwindow(19):PROCclock:VDU4:
ENDPROC
620 DEF PROClose !&82=&6AF8:
FORI%=&6AF8 TO (manx%-&28-&280)
STEP&8:CALLdragon:!&82=I%:CAL
Ldragon:SOUND0,-10,4,1:A=INKEY
(20):IFI%&manx%-&280-&48 CALLm
an
630 NEXT:FORJ%=&T03:FORI%=&T
0100:VDU7:*FX15
640 NEXT:A=INKEY20:NEXT:ENDP
ROC
650 DEF PROCquestion PROCwin
dow(14):REPEAT
660 IF level%&1 time%=(RND(12
)-1)*100 ELSE IF level%&2 time
%=(RND(12)-1)*100+(RND(2)-1)*3
0 ELSE IF level%&3 time%=(RND(
12)-1)*100+(RND(4)-1)*15 ELSE
IF level%&4 time%=(RND(12)-1)*
100+(RND(12)-1)*5 ELSE time%=(R
ND(12)-1)*100+RND(59)-1
670 UNTIL time%DIV100<>time%
MOD100 DIV5:PROChands(time%):C
OLOUR3:right%&RND(4):d%&0:FORc
%=&T04
680 IF c%&right% a$=STR$(tim
e% DIV100):b$=STR$(time% MOD10
0):type%&RND(3) ELSE a$=STR$(t
ime% MOD100 DIV5):b$=STR$(time%/
DIV100*5):d%&d%+1:type%&d%
690 IF a$=&0 a$=&12
700 PROCwrite:PRINTTAB(0,2*c
%-1);c$(c%):COLOUR2:NEXT:ENDP
OC
710 DEF PROCwrite IF type%&1
c$(c%)&=a$+1:STRINGS(2-LENb$,
0)+b$:IF RND(2)=1 c$(c%)&=c$(c
%)+ pm ELSE c$(c%)&=c$(c%)+
am

```

```

720 IFtype% = 1 ENDPROC
730 IFtype% = 3 c$(c%) = STRING$(2-LENa$, 0) + a$ + STRING$(2-LENb$, 0) + b$ + " hours":ENDPROC
740 IFb$ = "15" b$ = "quarter past" ELSE IFb$ = "30" b$ = "half past" ELSE IFb$ = "45" b$ = "quarter to " :a$ = STR$(VAL(a$)+1) ELSE IFb$ = "0" b$ = "0 o'clock"
750 IFVALb$ > 30 b$ = STR$(60-VALb$) + " to " :a$ = STR$(VAL(a$)+1)
ELSE IFVALb$ > 0 b$ = b$ + " past "
760 IFa$ = "13" a$ = "1"
770 IFb$ = "0 o'clock" c$(c%) = a$ + b$ ELSE c$(c%) = b$ + a$
780 ENDPROC
790 DEF PROChands(min%) hr = (min% / 100) * 30: min% = min% MOD 100 * 6 :GCOL3,3:MOVE1120 + SIN(RAD(min% - 90)) * 7,160 + COS(RAD(min% - 90)) * 7:MOVE1120 + SIN(RAD(min% - 90)) * -11,160 + COS(RAD(min% - 90)) * -11:PLT85,1120 + SIN(RAD(min%)) * 132,160 + COS(RAD(min%)) * 122
800 MOVE1120,160:DRAW1120 + SIN(RAD(hr)) * 90,160 + COS(RAD(hr)) * 80:ENDPROC
810 DEF PROChand2(sec%) GCOL3,1:MOVE1120,160:DRAW1120 + SIN(

```

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```

RAD(sec%))*140,160+COS(RAD(sec%))*130:ENDPROC
  820 DEF FNget_answer PROCChan
d2(0):line%:1:m%:0:n%:0:*FX21
  830 REPEAT key%:INKEY0:IF ke
y%:1380Rkey%:139 COLOUR2:PRINT
TAB(0,2*line%-1);c$(line%)
  840 IFkey%:139 Line%:line%-1
ELSE IFkey%:138 Line%:line%+1
  850 IFline%<1 Line%:1 ELSE I
Fline%>4 Line%:4
  860 IFkey%:1380Rkey%:139 COL
OUR3:PRINTTAB(0,2*line%-1);c$(line%)
  870 n%:n%+1:IF n%:55-level%*10
n%:0:PROChand2(m%):PROChand
2(m%+6):m%:m%+6:SOUND1,-5,255,
1
  880 UNTILkey%:130Rm%>=360:PR
OChand2(m%):IF m%>=360 =1 ELSE
=(line%:right%)
  890 DEF PROCright PROCwindow
(14):VDU17,3,31,2,2:PROClarge(
"Correct!"):SOUND1,2,50,4:PROC
man:man%:manx%:manx%-10:PROCman:SC
%:5$C%:5:IF manx%<&6DCB dragon%:0
=0
  900 ENDPROC
  910 DEF PROCwrong PROCwindow
(14):COLOUR3:IF correct%:0 VDU
31,3,0:PROClarge("Wrong!") ELS
E VDU31,2,0:PROClarge("Too Slo
w!")
  920 VDU17,1,31,0,5:PRINT The
time was:VDU17,2,31,(12-LENc
$(right%))DIV2,7:PRINTc$(right
%);::fx21
  930 I%:INKEY400:Lives%:lives
%-1:mistakes%:mistakes%+1:SC%:SC%:10:ENDPROC
  940 DEF PROCwin SOUND0,-15,7

```

```

1: SOUND1,-15,230,1:PROCwindow
(19):VDU17,2,31,2,1:PROCbig('S
core'):VDU17,3,31,3,5:PROCbig(
STR$SCX):!&82=86AF8:CALLdragon
:RESTORE590:FORget%1T05:READa
ddress:FOR1%=manx%&8 TO &6060
STEP-&8:CALLman:manx%1%
950 PROCman:SOUND0,-5,4,1:A=
INKEY(6):NEXT:!&86=address:CAL
Ldiamond:!&86=86D5C:CALLdiamond
:FOR1%=&6060 TO &6E50 STEP &8
:CALLman:CALLdiamond:manx%1%:
!&86=1%:PROCman:CALLdiamond:SO
UND0,-5,4,1:A=INKEY(6):NEXT
960 FOR1%=&6E50 TO &7FD0 STE
P &140:FORJ%=IXT01%+&7STEP4:CA
LLdiamond:!&86=J%:CALLdiamond:
SOUND1,-10,&7FD0-J% DIV &128,1
:NEXT:NEXT:CALLdiamond:SOUND&1
1,-15,230,1:VDU31,3,5:SCX=SCX+
10:PROCbig(STR$SCX+'):NEXT:E
NDPROC
970 DEF FNanother PROCwindow
(19):VDU17,3:IFlives%>0 AND le
vel%5 PROCcongrats:=0 ELSEVDU
31,1,0:PROCbig('Would you like
to'):IF lives%>0 PRINTTAB(0,3
);:PROCbig('try the next level
?') ELSE PRINTTAB(2,3);:PROCbi
g('be reincarnated?')
980 VDU17,2,31,4,8:PRINT'Pre
ss Y or N';:REPEAT:AS=GET$:SX=
INSTR('YyNn',AS):UNTILSX>0:IFI
lives%>0 LevelX=level%+1:IFleve
LX>5levelX=5
990 IFdragonX=-1 PROCdiamond
s
1000 VDU24,244;384;1279;544;1
6:IF$X<3 SOUND1,3,100,6:=-1 EL
SE =0
1010 DEF PROCwindow(X%) VDU4,
26,28,0,31,XX,22,12:ENDPROC
1020 DEF PROChigh PROCspeedon
:IFSCX>=HSX(5) PROCshunt
1030 VDU26,12,31,4,3,17,3:PRO
Clarge('Knoble Knights'):VDU31
,3,7,17,1:PRINT STRING$(15,CHR$245):FORDX=1T05:NS='Sir '+HNS(
DX):VDU17,3,31,0,9+DX*3:PROCbi
g(NS):VDU17,2,31,20-LEN(STR$HS
X(DX)),9+DX*3:PROCbig(STR$HSX(
DX)):NEXT
1040 PROCspeedoff:PROCkey:END
PROC
1050 DEF PROCshunt HSX(5)=SCX
:HSX(5)=name$:FOR1%5T02STEP-1
:IFHSX(1%)>HSX(1%-1) SX=HSX(1%
):HSX(1%)=HSX(1%-1):HSX(1%-1)=
SX:HSX(1%)=HNS(1%):HNS(1%)=HNS(1%-1
):HNS(1%-1)=NS
1060 NEXT:ENDPROC
1070 DEF PROClarge(AS) FORKX=
TTOLENAS:BS=MID$(AS,K%):?&70=A
SC B$:A%10:XX=&70:Y%0:CALL &
FFF1:VDU23,252,?871,?871,?871,
?871,?872,?872,?872,?872:VDU23
,253,?873,?873,?873,?873,?874,
?874,?874,?874
1080 VDU23,254,?875,?875,?875
,?875,?876,?876,?876,?876:VDU2
3,255,?877,?877,?877,?877,?877
,?878,?878,?878:FOR P%1 TO 4:
VDU251+P%:IF P%<4 VDU 8,10
1090 NEXT:VDU11,11,11:NEXT:EN
DPROC
1100 DEF PROCcongrats VDU26,1
2:PROCspeedon:VDU31,5,3,17,3:P
ROCbig('Well done!'):VDU31,4,5
,17,1:PRINT STRING$(12,CHR$245)
:VDU31,1,8,17,2:PROCbig('You h
ave completed'):VDU31,2,11:P
ROCbig('all five levels'):COLOUR
3
1110 VDU17,2,31,7,14:PROCbig(
'with'):VDU17,3,31,4,17:IF mis
takes%0 PROCbig('no') ELSE PR
OCbig(STR$mistakes%)
1120 PROCbig('mistakes!'):VD
U17,2,31,2,20:PROCbig('Now let
's see if'):VDU31,2,23:PROCbig(
'someone else can'):VDU31,4,2
6:PROCbig('beat you...'):PROC
speedoff:PROCkey:ENDPROC
1130 DEF PROCkey:FX15
1140 VDU17,0,17,129,31,0,31:P
RINT' Press a key ':RES
TORE180:REPEAT:PROCTune(-10):A
=INKEY(0):UNTILNOTA:COLOUR128:
CLS:ENDPROC
1150 DEF PROCspeedon FOR1%1T
03:VDU19,1%,0,0,:NEXT:ENDPROC
1160 DEF PROCspeedoff VDU19,1
,2,0,0,19,2,3,0,0,19,3,7,0,0,0
:ENDPROC
1170 DEF PROCassemble PROCspe
eden:RESTORE240:FORbyte=0T0509
:READdata:byte?85000:DATA:NEXT
:OSWRCH=&FFEE:OSWORD=&FFF1:NEW
=87A:ROWS=&70:COLUMNS=&7D:TEMP
1=87E:FORPASS=0T02STEP2:P%&90
0:COPTPASS
1180 .D STAB:LDA#10:LDX#B AND
255:LDY#B DIV256:JSRROSWORD:LDA
#0:STAJ#1 D1 LDA#23:JSRROSWRCH:L
DAJ:ORA#224:JSRROSWRCH:LDAJ:ASL
A:ASLA:TAX:LDY#4:.D2 INX:LDAB,
X:JSRROSWRCH:JSRROSWRCH:DEY:BNE
D2:INCJ:LDAJ
1190 CMP#2:BNE#1:LDX#4:.D3 LD
A,X:JSRROSWRCH:DEX:BPLD3:RTS
1200 .MAN LDA&80:STAnew:LDA&8
1:STAnew+1:LDA#&80:STAnewdata+1:L
DA#&80:STAnewdata+2:LDX#4:S
TXcolumns:LDY#24:STYrows:LDY#0
:JSRput:RTS
1210 .diamond LDA&86:STAnew:L
DA&87:STAnew+1:LDA#&60:STAnewd
ata+1:LDA#&50:STAnewdata+2:LD
X#2:STXcolumns:LDY#7:STYrows:LD
Y#0:JSRput:RTS
1220 .dragon LDA&82:STAnew:L
DA&83:STAnew+1:LDA#&6E:STAnewd
ata+1:LDA#&50:STAnewdata+2:LD
X#10:STXcolumns:LDY#40:STYrows:L
DY#0:JSRput:RTS
1230 .put:.loop1:LDAnew+1:STA
temp1+1:LDAnew:STAtemp1:LDXrow
s:.loop2:.newdata LDA &3000,Y:
EOR(new),Y:STA(new),Y:INCnewda
ta+1:BNE#3:INCnewdata+2:.P3 LD
Anew:AND #7:CM#7:BEQbottom2
1240 INCnew:BNE#4:INCnew+1:.P
4 BNE next2
1250 .bottom2 CLC:LDAnew:ADC#
&39:STAnew:LDAnew+1:ADC#1:STA
new+1:.next2:DEX:BNE Loop2:LDA
temp1:ADC#8:STAnew:LDAtemp1+1:A
DC#0:STAnew+1:DECcolumns:BNElo
op1:RTS
1260 .B:J
1270 J=b+9:s=j+1:$s=CHR$11+CH
R$225+CHR$8+CHR$10+CHR$224:NEX
T:ENDPROC

```

*This listing is included in this month's cassette tape offer. See order form on Page 53.*

**GRIDDER** is a fascinating puzzle designed to give the old grey matter a good workout. It's a cross between Rubik's Cube and a sliding block puzzle and just as frustrating.

It may seem a simple enough game, but it's difficult to play well.

You are presented with a large five by five grid of coloured blocks with an arrow on one side. Figure I shows the screen at the start of the game.

The object is to generate a large version of the small target-like pattern displayed on the left of the screen. Figure II shows what the puzzle will look like when you've completed it.

You can slide a row or column of blocks in the direction of the arrow by pressing the spacebar. In Figure I the middle row will slide left.

The leftmost block will be removed, the other four will slide left and the block removed is placed to the far right at the end of the row — difficult to explain but very easy to understand if you try it and see.

The arrow can be moved around the grid with < and > so you can select any row or column.

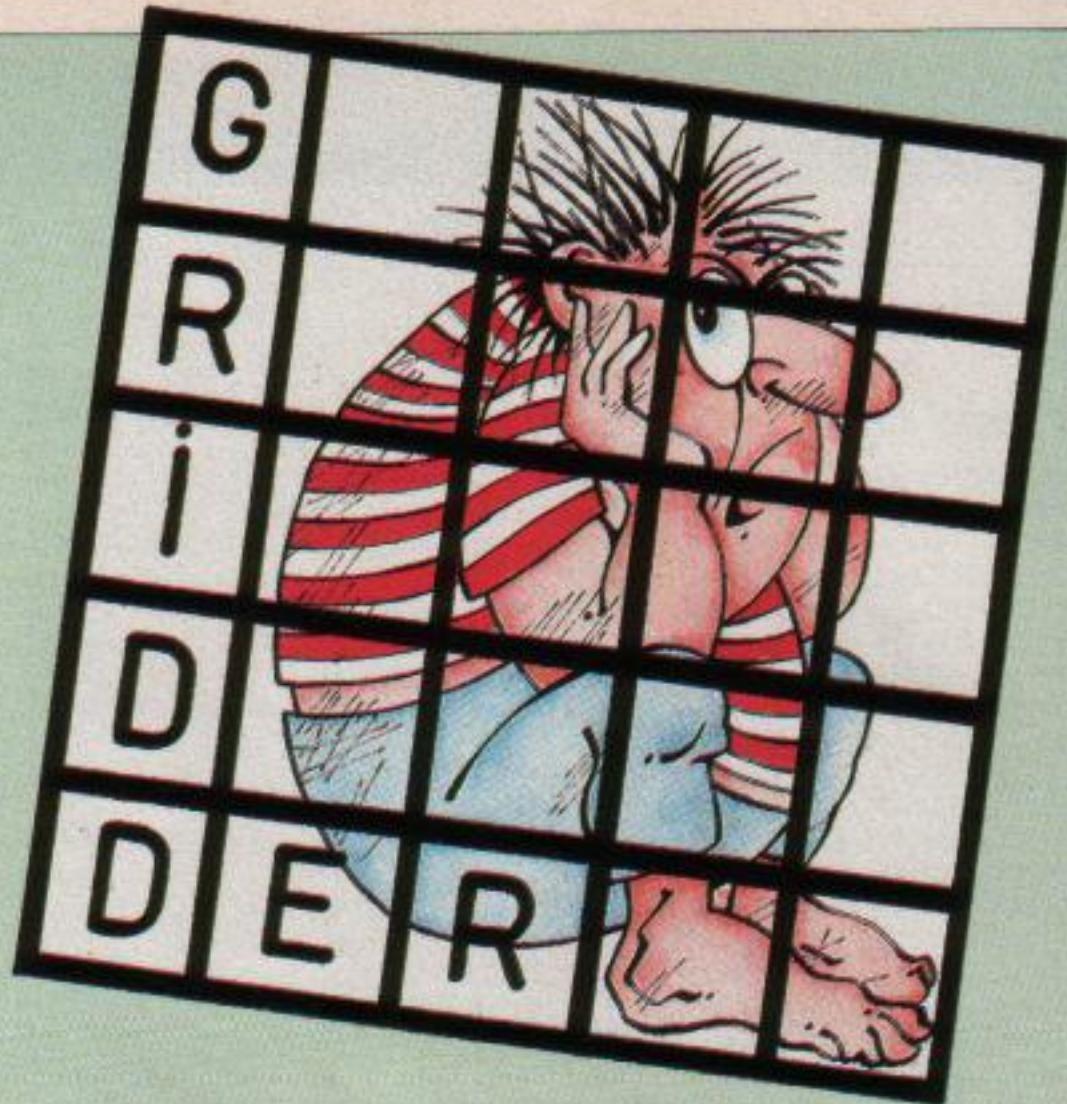
There is a time limit so you'll have to work as fast as possible. Don't be too surprised if you don't complete it first time — but it can be done with practice.

If you solve the puzzle within the allotted time you move on to a more challenging puzzle with more blocks.

Gridder is fun, addictive and should keep you occupied for many hours. Good luck!

### PROCEDURES

vars      Initialises the variables.  
 square    Draws a square.  
 set\_boxes    Draws the screen display.  
 move      Slides a line of squares.  
 delay     Slows the program down.  
 finished    Prints final message.  
 tune      Plays some music.



By William McGregor

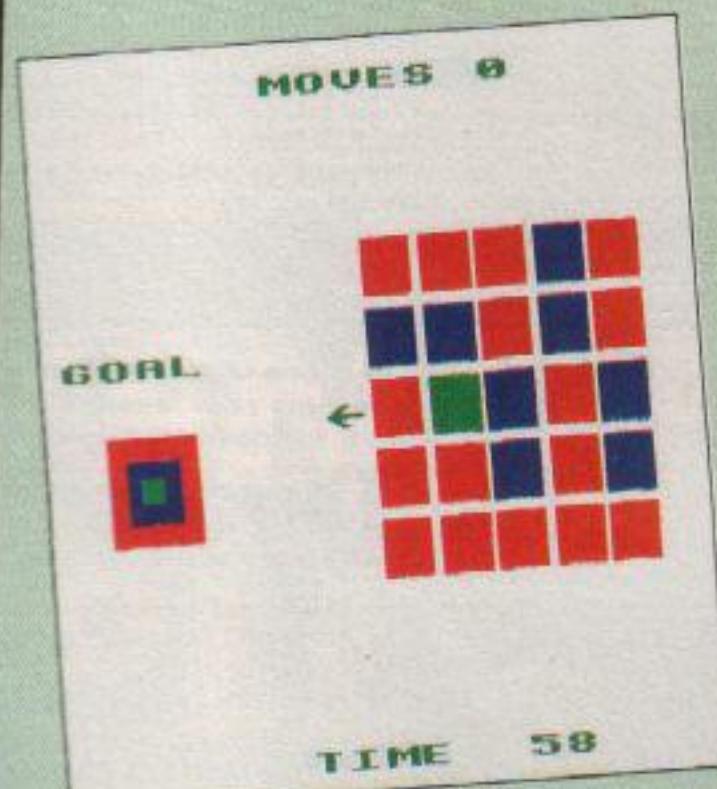


Figure I: The puzzle mixed

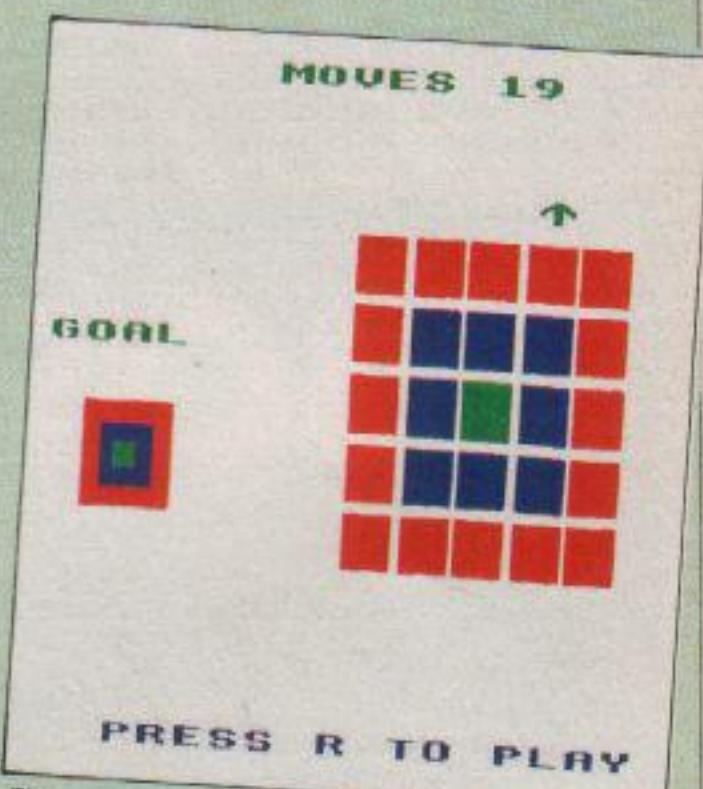


Figure II: The puzzle solved

### VARIABLES

box%      The colours of the grid.  
 size%     The size of the grid.  
 test%     See if you've done it.  
 move%    Number of moves made.  
 px%,py%   Coordinates of the pointer.  
 limit%    Time limit.

### CONTROLS

Space = Slide blocks  
 > = Move anticlockwise  
 < = Move clockwise

Full listing starts  
on Page 38

### ***Gridder listing***

**From Page 37**

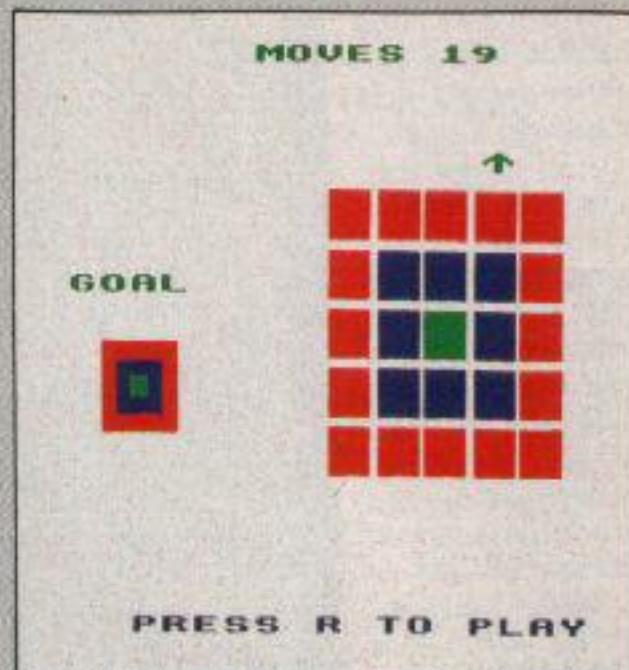
```

1390 IF px%>size%+1 py%>0
1260 PROCcursor(0)
1270 ENDPROC
1280 IF px%=-1 py%>py%-1 ELSE
py%>py%+1
1290 IF py%=-1 px%>0 ELSEIF p
y%>size%+1 px%>size%
1300 PROCcursor(0)
1310 ENDPROC
1320 :
1330 DEFPROCcursor(chr%)
1340 IF chr%>240 GCOL0,0 ELSE
GCOL0,3:PROCchr
1350 MOVE px%*100+left%*20,py
%*99+bottom%*50
1360 PRINT CHR$(chr%)
1370 ENDPROC
1380 :

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```

1390 DEFPROCchr
1400 IF px%=-1 chr%>241:ENDPR
OC
1410 IF py%=-1 chr%>242:ENDPR
OC
1420 IF px%>size%+1 chr%>243:
ENDPROC
1430 IF py%>size%+1 chr%>244:
ENDPROC
1440 :
1450 DEFPROCswitch
1460 SOUND1,-15,176,3:SOUND1,
-15,184,3
1470 IF px%=-1 OR px%>size%+1
GOTO1580
1480 IF py%=-1 t%>0:r%>1:inc%
=1 ELSE t%>size%:r%>size%-1:in
c%=-1
1490 temp%>box%(px%,t%)
1500 FOR(%=t%TOsize%-r% STEPi
nc%
1510 box%(px%,l%)>box%(px%,l%
+inc%)
1520 NEXT
1530 box%(px%,size%-t%)>temp%
1540 FORy%>0TOsize%
1550 PROCsquare(px%,y%)
1560 NEXT
1570 ENDPROC
1580 IF px%=-1 t%>0:r%>1:inc%
=1 ELSE t%>size%:r%>size%-1:in
c%=-1
1590 temp%>box%(t%,py%)
1600 FORl%>t%TOsize%-r% STEPi
nc%
1610 box%(l%,py%)>box%(l%+inc
%,py%)
1620 NEXT
1630 box%(size%-t%,py%)>temp%
1640 FORx%>0TOsize%
1650 PROCsquare(x%,py%)
1660 NEXT
1670 ENDPROC
1680 :
1690 DEFPROCdelay(delay%)
1700 mark%>TIME+delay%
1710 REPEAT
1720 UNTIL TIME>mark%
1730 ENDPROC
1740 :
1750 DEFPROCadd
1760 VDU4
1770 move%>move%+1
1780 PRINTTAB(12,0);move%
1790 VDU5
1800 ENDPROC
1810 :
1820 DEFFNtest
1830 test%>TRUE
1840 FORy%>1TOsize%-1 STEP(si
ze%-2)
1850 FORx%>1TOsize%-1
1860 IFbox%(x%,y%)<>2 test%>F
ALSE
1870 NEXT
1880 NEXT
1890 FORx%>1TOsize%-1 STEP(si
ze%-2)
1900 FORy%>2TOsize%-2
1910 IFbox%(x%,y%)<>2 test%>F
ALSE
1920 NEXT
1930 NEXT
1940 mid%>size% DIV2
1950 IFsize% MOD2<>0 THEN 198
0
1960 IFbox%(mid%,mid%)<>3 tes
t%>FALSE
1970 =test%
1980 FORx%>mid% TO mid%+1
1990 FORy%>mid% TO mid%+1
2000 IFbox%(x%,y%)<>3 test%>F
ALSE
2010 NEXT
2020 NEXT
2030 =test%



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programs now available  
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```

2040 :
2050 DEFPROCfinished
2060 CLS
2070 PRINTTAB(2,10)'CONGRATUL
ATIONS'
2080 PRINTTAB(6,13)'YOU HAVE'
2090 PRINTTAB(5,15)'COMPLETED
2100 PRINTTAB(4,17)'THE PUZZL
E'
2110 COLOUR131
2120 FORy% = 13 TO 15
2130 PRINTTAB(15,y%)"
2140 PRINTTAB(15,17)"
2150 NEXT
2160 COLOUR128
2170 *FX15
2180 A=GET
2190 ENDPROC
2200 :
2210 DEFPROCtitle
2220 COLOUR0:COLOUR129
2230 PRINT TAB(14,1)' GRIDDER
2240 COLOUR1:COLOUR128
2250 PRINT"The object of th
is puzzle is to slide"the ro
ws and columns of a multicolou
red grid around to make a targ

```

```

et-like"pattern. (The target
is displayed to the left of ea
ch grid)."
2260 PRINT"If you complete
the puzzle within the"time l
imit you move to a more compl
ex pattern"
2270 COLOUR0:COLOUR129:PRINT'
"Controls"
2280 COLOUR1:COLOUR128:PRINT'
"<.....rotate pointer anticl
ockwise"
2290 PRINT">.....rotate po
inter clockwise"
2300 PRINT"SPACE...slide the
blocks in the"TAB(8)"directi
on of the pointer"
2310 COLOUR0:COLOUR129
2320 PRINTTAB(11,30)" PRESS A
NY KEY"
2330 *FX15
2340 A=GET
2350 ENDPROC
2360 :
2370 DEFPROCtune
2380 RESTORE 2440
2390 FOR r% = 1 TO 8
2400 READ note%,length%
2410 SOUND&0001,-15,note%,len

```

```

gth%
2420 NEXT
2430 ENDPROC
2440 DATA148,3,164,4,148,3,16
4,3,176,4,164,3,176,3,196,12
2450 :
2460 DEFPROCcharacters
2470 VDU23,240,255,255,255,25
5,255,255,255,255
2480 VDU23,241,24,48,96,255,2
55,96,48,24
2490 VDU23,242,24,24,24,153,2
19,126,60,24
2500 VDU23,243,24,12,6,255,25
5,6,12,24
2510 VDU23,244,24,60,126,219,
153,24,24,24
2520 ENDPROC
2530 :
2540 DEFPROCbox(a%,b%,width%,c
olour%)
2550 GCOL0,colour%
2560 MOVEa%,b%
2570 PLOT0, width%,0
2580 PLOT81,-width%,width%
2590 PLOT81, width%,0
2600 ENDPROC
2610 :
2620 DEFPROCtarget

```

```

2630 data% = 2710 + (size% - 4) * 10
2640 RESTORE data%
2650 IF size% < 6 numreads% = 3 E
LSE numreads% = 4
2660 FOR l% = 1 TO numreads%
2670 READ a%,b%,width%,colour%
2680 PROCbox(a%,b%,width%,col
our%)
2690 NEXT l%
2700 ENDPROC
2710 DATA 75,375,150,1,105,40
5,90,2,135,435,30,3
2720 DATA 60,360,180,1,90,390
,120,2,120,420,60,3
2730 DATA 45,345,215,1,75,375
,150,2,105,405,90,1,135,435,30
,3
2740 DATA 30,330,245,1,60,360
,180,2,90,390,120,1,120,420,60
,3

```

*This listing is included in  
this month's cassette  
tape offer. See order  
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**WIMPs, Desktop and Gem** are terms you may have heard recently, perhaps in connection with Master Compact, Amstrad PC and Atari ST computers.

The terms refer to an operating environment providing a friendly interface between the computer and the user.

It is commonly found on powerful micros with large amounts of ram and costing many hundreds of pounds, not on home computers like the Electron.

Gem is Digital Research's Graphics Environment Manager which uses WIMPs - Windows, Icons, Menus and Pointers. It is designed with the novice in mind and enables you to use a computer with the minimum of fuss.

You don't need to know anything about the micro, operating system, how to load or save files, command syntax and so on, as files are often represented on screen by small pictures or icons.

A pointer can be moved round the screen, using a mouse or cursor keys, and a file, program or utility selected and run by clicking the mouse button when pointing at an icon.

You can easily enter a word processor, spreadsheet or database, leave it

# WIMPS

**Transform your Electron with a fully fledged desktop environment, featuring Gem-like windows, menus and pointers**

**By ROLAND WADDILOVE**

and enter another package simply by pointing to an icon or menu option and clicking the select button.

This is the ultimate in user-friendly environments and enables anyone with just a passing knowledge of computers to use powerful and flexible packages.

Now, with the aid of the utility presented here, you can have your own Electron

desktop package featuring Gem-like windows, menus and pointers.

It provides you with a notepad complete with text editor, real or elapsed-time clock, art package and card index database system all in one short program.

When Wimps is run you'll see a menu with five options printed across the top of the screen. A pointer just below

this can be moved left and right using the cursor keys and an item is selected by pressing Copy.

The first menu option, Pad, can be seen in Figure I. This is the notepad which can be used for jotting down short notes, memos, shopping lists, telephone numbers and letters.

You can move the flashing text cursor anywhere on the screen by holding down Control and pressing A, Z, < and >. To enter text simply type away.

Using the cursor left and right keys followed by Copy you can select any of the five pad menu options at the top of the screen. These can be used to load, save, print and erase the text on the notepad.

When you quit, the text is stored in memory and will still be there if you return to the notepad later. Of course, it will be lost if you switch off your Electron without saving it.

Please note that if you are running Wimps from tape you won't see any cassette prompts or messages. You should press Play (and Record if recording), whenever a prompt for a filename appears. Press Stop when the file has finished loading.

Wimps is best when run

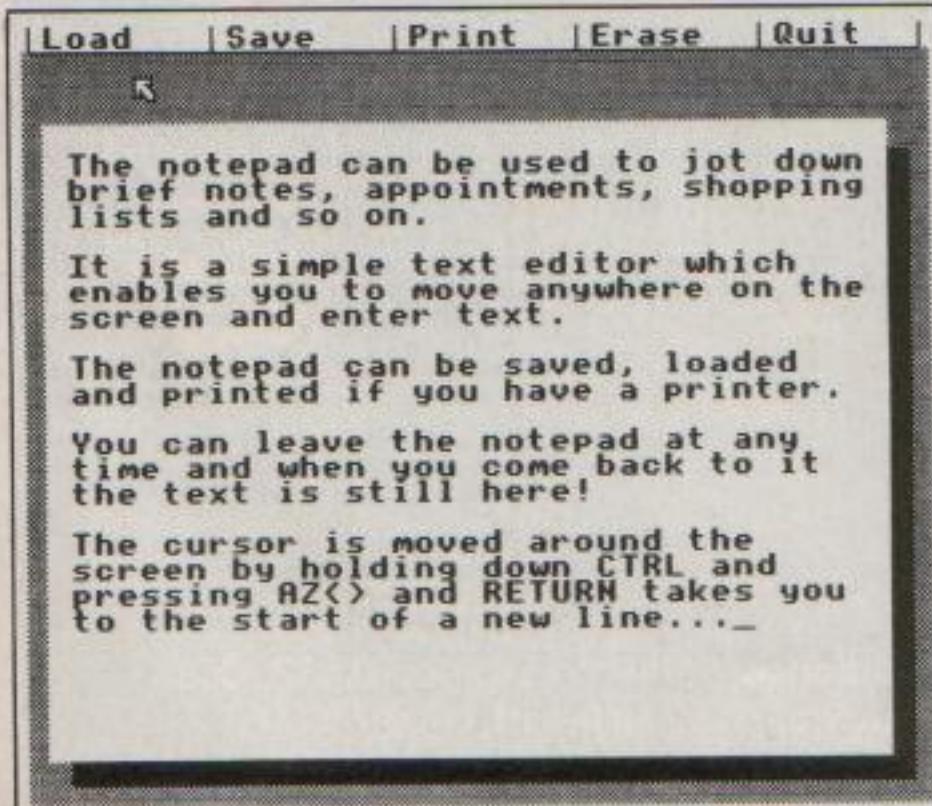


Figure I: The notepad

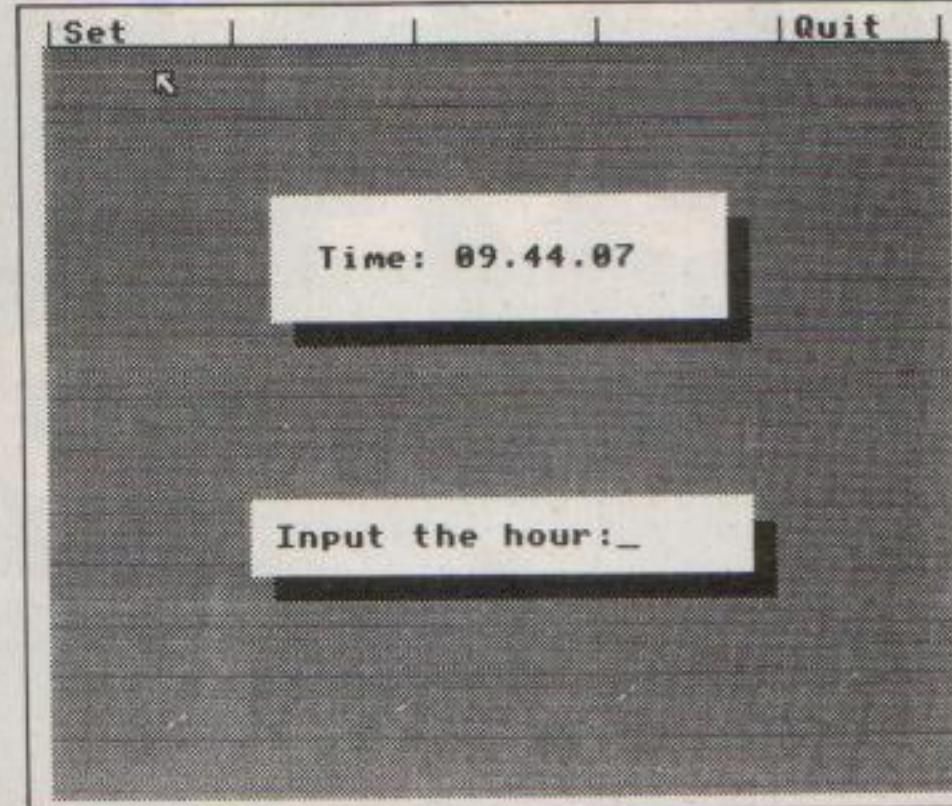


Figure II: The clock

from disc because of the great speed increase when loading and saving the notepad, card index and art screens.

The second option from the main menu is to see the clock, shown in Figure II. This will display the time elapsed since you started up Wimps but if you wish you can set it to the true time by selecting the first option from the clock menu.

The clock will keep the time while using the program's other facilities so you can come back to it whenever you wish to see what the time is.

The third option from the main menu enters the art package, shown in Figure III. This can be used to draw pictures and design screens which can then be saved on tape or disc.

When you enter Art you'll be presented with a blank screen with a pencil in the middle. Use A, Z, < and > to move it round the screen, (the keys are the same as with the notepad except that you don't need to hold down Control).

To draw a line press Return to fix one end, move to the other and press Return again. A rubber banding technique is used which enables you to stretch the line from the start point and move it round the screen before setting its final position.

Circles can be drawn by selecting the Circle option from the art menu at the top of the screen. Move the pointer using the cursor

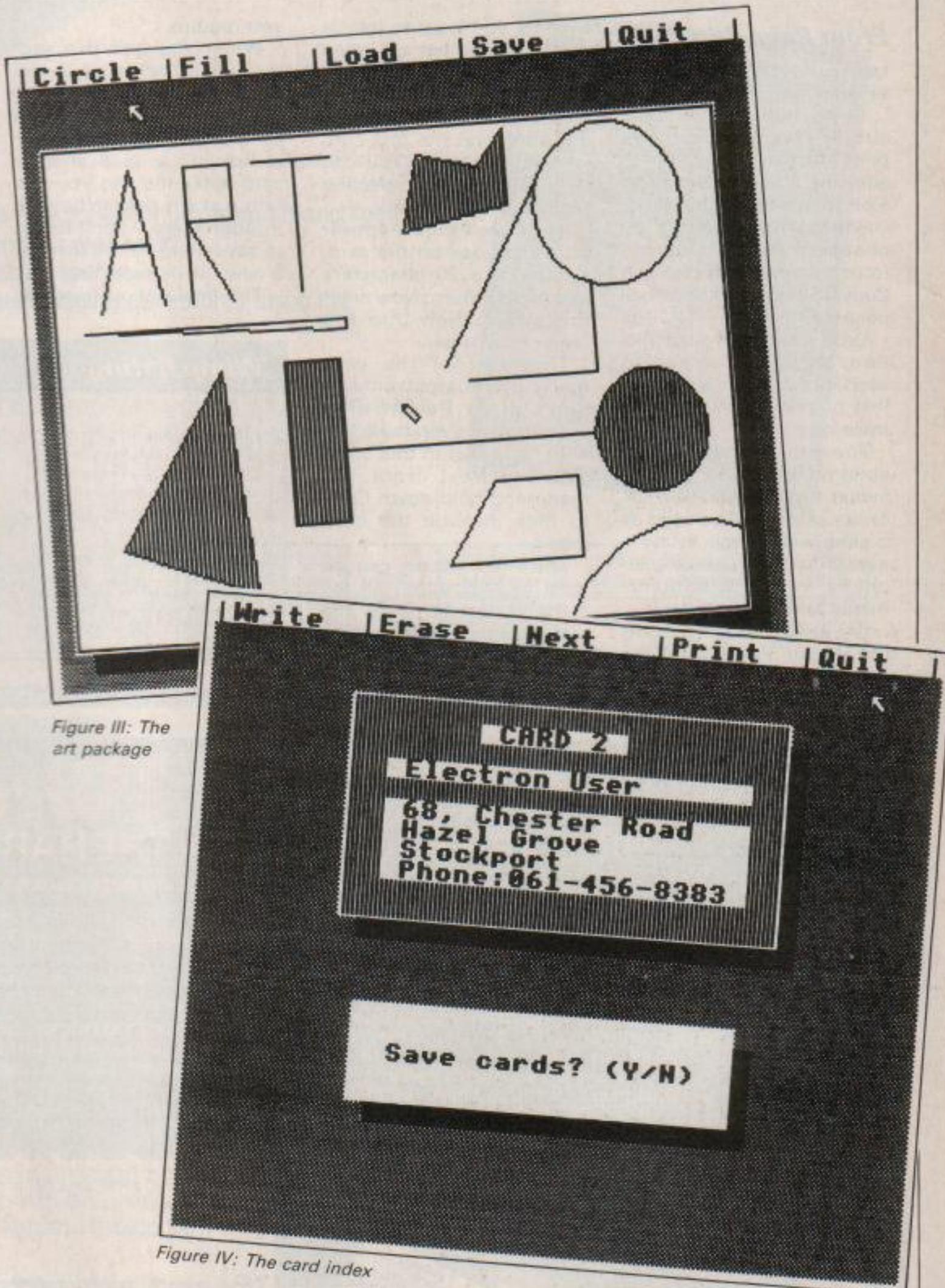


Figure IV: The card index

## VARIABLES

S%	The option selected from the main menu.
X%	The pointer's x coordinate.
T%	The time.
name\$	The filename.
pad	Used for the notepad.
cards	Used to store the card index.
sin, cos	Sines and cosines for drawing circles.

## PROCEDURES

menu	Print the main menu.
cls	Clear the screen.
pointer	Move the pointer.
select	Select an option.
window	Set up a window.
name	Ask for filename.
initialise	Dimension arrays.

# Utility

## From Page 41

keys and press Copy to select.

You'll now see a small circle drawn where the pencil was. Use **<** and **>** to alter the size and Return to fix it in position.

Shapes can be filled by choosing the Fill option from the menu and pressing Copy. It fills from the pencil position.

Quit will destroy the picture, so, if you intend to keep it remember to save it first before returning to the main menu.

The fourth main menu option takes you to the card index, shown in Figure IV. These cards may be used as a simple database to store names and addresses, telephone numbers, appointments and so on.

On selecting Card from the menu you'll first be

asked if you want to load a file. Any number of index files can be stored, each holding 20 cards.

Following this the screen will clear and the first card will be displayed. You can write a record by selecting the first menu option.

You'll see a cursor appear in the top box on the card. Enter up to 20 characters and press Return. Now enter the information into the larger box below.

This part of the card requires one input only so don't press Return until you've typed everything you wish to appear in this box.

Select Next from the menu and hold down Copy to flick through the card index.

The Print option can be used to print either all the cards or the currently displayed one and a prompt will appear asking which

you require.

When you quit this section you'll be asked if you wish to save the cards.

They are stored in memory until you either switch off or load another card index file and you can return at any time to browse through them – don't forget to save them before loading a new file or switching off.

The final option from the

main Wimps menu is to quit the desktop program. You'll be asked to confirm this in case you've forgotten to save the notepad or card index.

You should find Wimps a powerful, friendly and very useful utility. I have just hinted at some of the possibilities and I'm sure you'll find many more applications. ■

## Wimp listing

```
10 REM WIMPs
20 REM By R.A.Waddilove
30 REM (c) Electron User
40 ON ERROR MODE6:REPORT:PR
INT" at line ";ERL:OSCLI"FX12,
4":OSCLI"FX4":END
50 MODE 4
60 PROCinitialise
70 PROCMENU
80 MODE 6:OSCLI"FX21":*FX4
110 DEF PROCinitialise
120 DIM cards 2100:c$=STRING
$(100,":FORI%0 TO 19:$("car
ds+I%*101)=c$":NEXT
130 DIM pad 1000:FORI%0 TO
25*37 STEP4:I%:pad=&20202020:N
EXT
90 END
100
```

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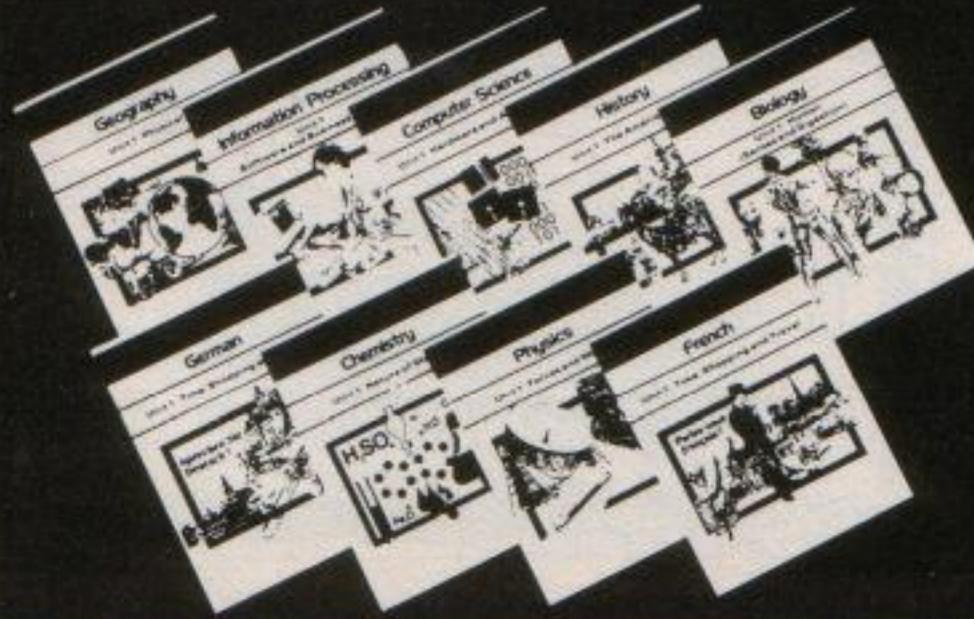
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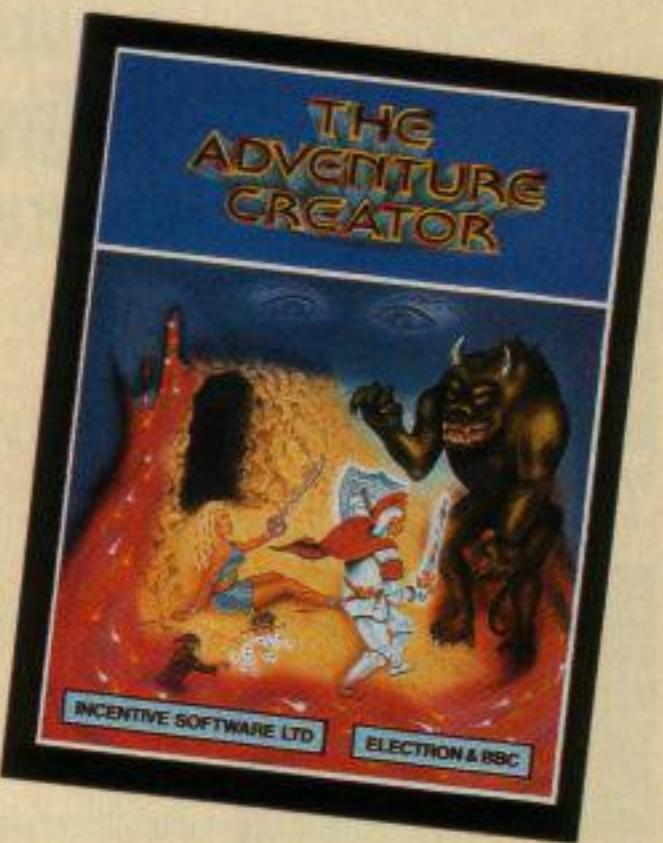
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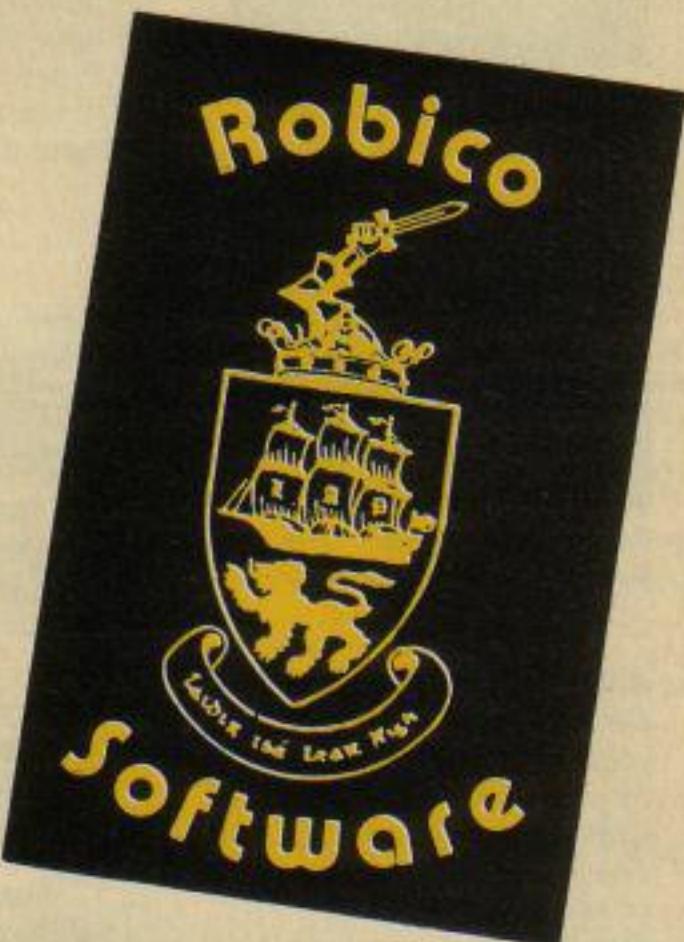
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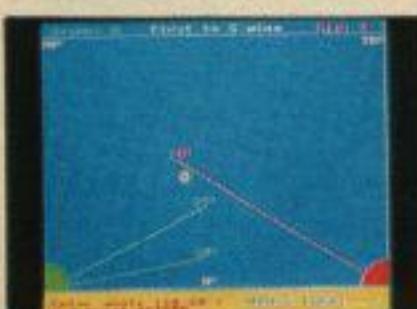


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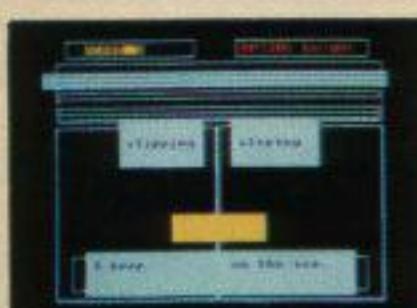
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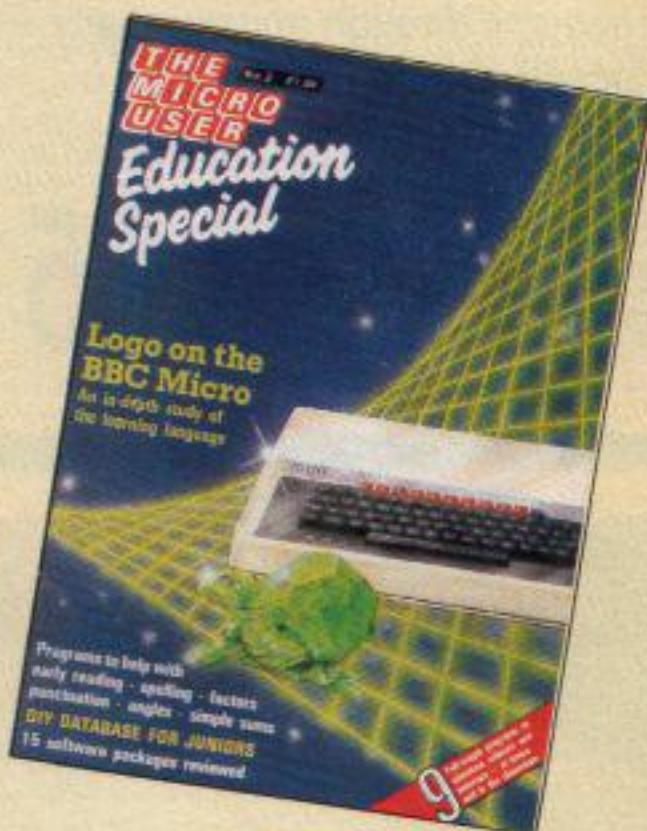
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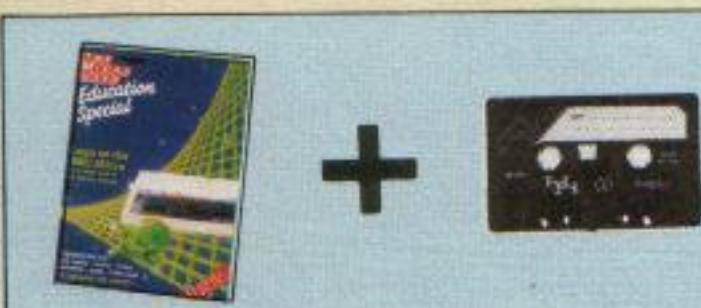
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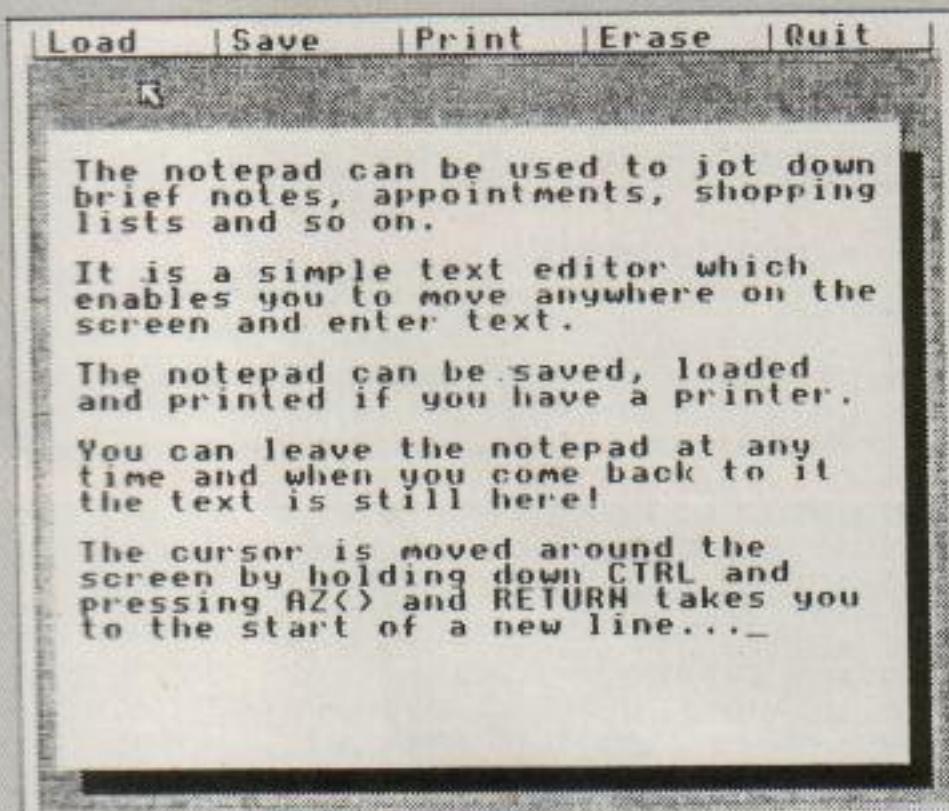
**To order turn to the form on Page 53**

## From Page 42

```

140 DIM sin(18),cos(18):FOR
IX=20 TO 360 STEP 20:sin(IXDIV
20)=SIN(RADIX):cos(IXDIV20)=C0
S(RADIX):NEXT
150 TIME=0
160 OSCLI"FX16":OSCLI"FX4,1"
:OPT1
170 VDU23,224,85,170,85,170,
85,170:REM Screen
180 VDU23,225,16,16,16,16,16
,16,16:REM Bar
190 VDU23,226,255,130,143,13
4,163,177,249,175:REM Pointer
200 VDU23,227,224,208,136,68
,34,17,18,4:REM Pencil
210 COLOUR129:COLOUR0:VDU26:
FORIX=0 TO 4:PRINT STRINGS(248
,CHR$224);:NEXT
220 COLOUR128:VDU30,11
230 GCOL 0,1:MOVE 0,0:DRAW 0
,994:DRAW 1278,994:DRAW 1278,0
:DRAW 0,0
240 GCOL 0,0:MOVE 16,956:PLO
T 1,1244,0
250 ox%3:X%3
260 ENDPROC
270
280 DEF PROCcls
290 COLOUR129:VDU26
300 FORIX=3 TO 30:PRINT TAB(
1,IX)STRINGS(38,CHR$224):NEXT
310 ENDPROC
320
330 DEF PROCmenu
340 REPEAT
350 VDU23,1,0;0;0;0;
360 PROCcls
370 PRINTTAB(0,1)CHR$225"Pad
"CHR$225"Clock "CHR$225"A
rt "CHR$225"Card "CHR$225
"Quit "CHR$225
380 PROCpointer
390 REPEAT
400 PROCselect
410 UNTIL S%
420 ON S% GOSUB 700,1020,129
0,1820,460
430 UNTIL S%5
440 ENDPROC
450
460 REM Quit
470 PROCwindow(8,10,4,22)
480 PRINT" Are you sure?
(Y/N)":*FX21
490 K%=GET AND &DF
500 IF K%>89 S%0
510 RETURN
520
530 DEF PROCpointer
540 ?880=POS:7881=VPOS:1882=
18388:REM store window
550 COLOUR129:VDU26,31,ox%,3
,224,31,X%,3,226:ox%=%
560 VDU28,?882,?883,?884,?88
5,31,?880,?881:REM restore win
dow
570 ENDPROC
580
590 DEF PROCselect
600 X%=%+(INKEY(-26) AND X%
>1)-(INKEY(-122) AND X%<38)
610 IF X%>ox% PROCpointer
620 IF INKEY(-106) S%=(X%-1)

```



```

DIV8+1:VDU7 ELSE S%0
630 ENDPROC
640
650 DEF PROCwindow(X%,Y%,H%,W%)
660 COLOUR128:VDU28,XX+1,Y%+
1+H%,XX+1+W%,Y%+1,12
670 COLOUR129:VDU28,XX,Y%+H%
,XX+W%,Y%,12
680 ENDPROC
690
700 REM Pad...Keys:RETURN an
d CTRL plus AZ<>
710 PRINT TAB(1,1)"Load "C
HR$9"Save "CHR$9"Print "CHR
$9"Erase "
720 FOR IX=100 TO 600 STEP 1
00:MOVE 640-IX,400-IXDIV2:PLOT
1,0,IX:PLOT 1,IX+1,0:PLOT 1,
0,-IX:PLOT 1,-IX-1,0:NEXT
730 PROCwindow(1,5,24,36):GC
OL0,1:MOVE 32,864:PLOT 1,1180,
0
740 FORIX=0 TO 923:VDU pad?I
%:NEXT:VDU30
750 VDU23,1,1;0;0;0;*:FX21
760 REPEAT K%=INKEY0
770 IF K%=28 IF POS+VPOS VDU
8
780 IF K%1 IF VPOS VDU11
790 IF K%26 IF VPOS<24 VDU1
0
800 IF K%30 VDU9
810 IF K%13 IF VPOS<24 VDU1
3,10
820 IF K%31 AND K%127 ?(pa
d+POS+37*VPOS)=K%:VDU K%
830 IF K%127 IF POS+VPOS VD
U K%:(pad+POS+37*VPOS)=32
840 PROCselect
850 IF S%1 OSCLI"LOAD"+FNna
me+STR$"(pad):CLS:FORIX=0 TO 2
5*37-2:VDU pad?IX:NEXT:VDU30,2
3,1,1;0;0;0;:PROCpointer
860 IF S%2 OSCLI"SAVE"+FNna
me+STR$"(pad)+" +3E8":VDU23,1,
1;0;0;0;:PROCpointer
870 IF S%3 PROCprint
880 IF S%4 CLS:FORIX=0 TO 2

```

```

1270 ENDPROC
1280
1290 REM Art...Keys:RETURN an
d AZ<>
1300 PRINT TAB(1,1)"Circle "C
HR$9"Fill "CHR$9"Load "CHR
$9"Save "
1310 FOR IX=100 TO 600 STEP 1
00:MOVE 640-IX,400-IXDIV2:PLOT
1,0,IX:PLOT 1,IX+1,0:PLOT 1,
0,-IX:PLOT 1,-IX-1,0:NEXT
1320 PROCwindow(1,5,24,36)
1330 GCOL0,0:MOVE 36,68:DRAW
36,856:DRAW 1208,856:DRAW 1208
,68:DRAW 36,68
1340 GCOL0,129:GCOL3,1
1350 px%600:py%500:PROCopen
1360 FX=FALSE:*FX21
1370 REPEAT K%INKEY0 AND &DF
1380 IF FX PROCline ELSE IF K
%13 FX=TRUE:AX=px%:BX=py%
1390 IF K%223 PROCopen:px%px
%+8*((K%12)-(K%14)):py%py+
8*((K%90)-(K%65)):PROCopen
1400 PROCselect:VDU24,40;72;1
204;852;
1410 IF S%1 IF FX=FALSE PROC
pen:PROCcircle:PROCopen
1420 IF S%2 IF FX=FALSE PROC
pen:PROCfill:PROCopen:*FX21
1430 IF S%3 IF FX=FALSE OSCL
I"LOAD"+FNname+"5800":PROCopen:
PROCpointer
1440 IF S%4 IF FX=FALSE PROC
pen:OSCLI"SAVE"+FNname+"5800 8
000":PROCopen:PROCpointer
1450 UNTIL S%5
1460 S%0:GCOL0,0
1470 RETURN
1480
1490 DEF PROCline
1500 IF K%13 PROCopen:GCOL0,0
:FX=FALSE
1510 FOR IX=1 TO 2:MOVE AX,BX
:DRAW px%,py%:NEXT

```

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```

1520 IF K%13 GCOL3,1:PROCopen
1530 ENDPROC
1540
1550 DEF PROCopen:MOVEpx%,py%:
VDU5,227,4:ENDPROC
1560
1570 DEF PROCfill
1580 GCOL0,0:28359=8A
1590 FOR K%=-4 TO 4 STEP8
1600 IX=px%:J%=py%
1610 REPEAT
1620 PLOT 77,IX,J%
1630 J%J%+K%
1640 UNTIL POINT(IX,J%)>1
1650 NEXT
1660 GCOL3,1
1670 ENDPROC
1680
1690 DEF PROCcircle
1700 RX=50:VDU29,px%,py%:*FX
21
1710 REPEAT
1720 RX=RX+16*((INKEY-103 AND
R%>5)-(INKEY-104))

```

**From Page 45**

```

1730 FOR I% = 1 TO 2
1740 IF INKEY-74 I% = 3: GCOL0,0
: VDU7
1750 MOVE R%, B: FOR J% = 1 TO 18
:DRAW R%*cos(J%), R%*sin(J%):NE
XT
1760 NEXT
1770 UNTIL I% = 4
1780 REPEAT UNTIL NOT INKEY-7
4
1790 GCOL3,1: VDU29,0;0;0;*:FX21
1800 ENDPROC
1810
1820 REM Card
1830 PRINT TAB(1,1)"Write 'C
HR$9'Erase 'CHR$9'Next 'CHR
$9'Print "
1840 IF FNask("Load") OSCLI$!L
DAD$+FNname+STR$"cards:PROCcls
1850 PROCpointer
1860 PROCwindow(8,5,10,23):?&
358=&AA:CLS
1870 MOVE 252,864:GCOL0,1:PL0
T 1,768,0:PL0T1,0,-352:PL0T 1,
-768,0:PL0T1,0,352
1880 (I% = 0:PROCcard
1890 REPEAT
1900 PROCselect
1910 IF S% = 3 (I% = (I% + 1) MOD 20:P
ROCard:FX21,5
1920 IF S% = 2 $(cards+C%*101) =
STRING$(100, "):PROCcard
1930 IF S% = 4 PROCprint_cards
1940 IF S% = 1 PROCwrite
1950 UNTIL S% = 5
1960 S% = 0
1970 IF FNask("Save") OSCLI$!
AVE$+FNname+STR$"cards)+" +82
0"
1980 RETURN
1990
2000 DEF PROCwrite
2010 $(cards+C%*101) = STRING$(100, "):PROCcard
2020 VDU28,10,8,29,8,12
2030 VDU23,1,1;0;0;0;*:FX21
2040 INPUT LINE"name$"
2050 c$ = LEFT$(name$, 20):c$ = c$ + STRING$(20-LENc$, " ")
2060 PRINT CHR$26:TAB(10, 8)c$"
2070 VDU28,10,13,29,10,12
2080 INPUT LINE"name$"
2090 c$ = c$ + LEFT$(name$, 80):c$ = c$ + STRING$(100-LENc$, " ")
2100 $(cards+C%*101) = c$:PROCc
ard
2110 VDU23,1,0;0;0;0;
2120 VDU28,8,15,31,5
2130 PROCcard
2140 ENDPROC
2150
2160 DEF PROCprint_cards
2170 IF FNask("All") A% = 0:B% =
19 ELSE A% = C%:B% = C%
2180 PROCcls:PROCpointer
2190 *FX3,10
2200 FOR I% = AX TO BX
2210 c$ = $(cards+I%*101)
2220 PRINT"
2230 FOR J% = B TO 4
2240 PRINT MID$(c$, 1+J%*20, 20
)
2250 NEXT
2260 NEXT
2270 *FX3
2280 PROCwindow(8,5,10,23):?&
358=&AA:CLS
2290 MOVE 252,864:GCOL0,1:PL0
T 1,768,0:PL0T1,0,-352:PL0T 1,
-768,0:PL0T1,0,352
2300 PROCcard
2310 ENDPROC
2320
2330 DEF PROCcard
2340 c$ = $(cards+C%*101)
2350 PRINT TAB(7,1)" CARD ";C
%+1;" "
2360 PRINT TAB(2,3)LEFT$(c$, 2
)
2370 FOR I% = 1 TO 4
2380 PRINT TAB(2,4+I%)MID$(c$,
1+I%*20, 20)
2390 NEXT
2400 ENDPROC
2410
2420 DEF FNask(opt$)
2430 PROCwindow(9,20,4,20)
2440 PRINT" " opt$" cards?
(Y/N)":*FX21
2450 REPEAT K% = GET AND &DF
2460 UNTIL K% = 89 OR K% = 78
2470 PROCcls
2480 =(K% = 89)
2490
2500 DEF FNname
2510 ?&80=POS:?&81=VPOS!:&82=
!&80:REM store window
2520 PRINT CHR$(26)TAB(1,3)ST
RINGS(38,CHR$224)
2530 VDU28,2,3,36,3,12
2540 VDU23,1,1;0;0;0;*:FX21
2550 REPEAT INPUT " Enter fil
ename":name$:UNTIL LENname$=
2560 VDU23,1,0;0;0;0;
2570 PRINT CHR$(26)TAB(1,3)ST
RINGS(38,CHR$224)
2580 VDU28,?&82,?&83,?&84,?&8
5,31,?&80,?&81:REM restore win
dow
2590 =" "+name$+" "

```

*This listing is included in this month's cassette tape offer. See order form on Page 53.*

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# Micro Messages

I ENJOY the various utility listings which you publish from time to time and I would enjoy them even more if you employed a checker program such as those used by some other computer magazines.

I find these very helpful as they make the task of typing in long programs much less daunting and time consuming.

Could you please tell me where I could obtain a copy of the book *Lisp on the BBC Microcomputer and Acorn Electron* by Cattell and Norman?

When I was last in the UK I tried all the book shops in my area but none were stocking it. I need it to enable me to understand and operate the Lisp cartridge I bought recently. — J.H. Salt, Sliema, Malta.

● We have considered the possibility of employing a checksum utility in our listings but it can create problems as well as solving them.

They can confuse novices and occasional readers and the presence of a checksum is no guarantee that the program is bug free.

All our programs (after

## The pros and cons of checksums

being thoroughly tested), are now transferred directly from an Electron to a professional laser typesetting machine.

The listings from this are pin-sharp and you should have far fewer problems entering them.

Watford Electronics at Jessa House, 250 Lower High Street, Watford has several books on Lisp and should be able to supply a manual.

We'll be following up our series on View with a beginners' guide to this fascinating language starting in the June issue of *Electron User*.

## Printer switches

I AM a regular subscriber to *Electron User* and always will be. I find your pages most useful as I use my

Electron mainly for business.

Could you please help me with a problem that is not uncommon? Can you give me a program which enables the Brother HR5 printer to produce graphics without the double line spacing?

I have found the code to print text without any spacing, but not the correct one for graphics. I want to print notepaper for business and T-shirts, so would be most grateful for your help or advice as to who to ask.

I have tried so many things on various computer buffs' advice — but to no avail. I also have Slogger's printer rom but that doesn't do the trick either. — Miss I.H. Legat, Ryde, Isle of Wight.

● If your text or graphics output is double spaced you need to alter one of the dip switches inside the printer. They are rather awkward to reach but there's a diagram

in your manual showing their location.

Flick switch number 2 to the opposite side and you should find the problem is cured.

## Error Messages

WE HAVE recently bought an Electron with Plus 1 but when we try to load some games with it fitted we get so far but they will not run.

This happens with two collections we have bought, *Computer Hits 3* and *Electron Power Pack*. The games which present this problem are *Mineshaft* and *Stranded*.

On *Power Pack*, *Wizzy's Mansion* will not load at all and *Space Ranger* will only load as far as the heading. We have tried using the command \*FX163,128 but this has no effect at all.

Another problem we have encountered this week is in typing in *Tommy and the Toadstools* from the February 1987 issue of *Electron User*. We continually get the message "Syntax Error at line 1890".

We have typed this program out twice (the first time we failed to save it, our own fault) with the same error message coming up each time. We have carefully checked the listing.

We did wonder if lines 120 and 150 were correct as these appear to have an odd number of brackets. We tried changing the last closed bracket to the number 1 but this didn't affect the syntax error.

Being novices at computer games can you help us to get on the boat in the second level of *Wondo*

## More on random numbers

AFTER reading the letter from Philip Ord in your February 1987 issue of *Electron User* on the subject of random numbers, I decided at once to type in and run the short program to see if my micro had the same handicap.

No, I ran the program four or five times and got a completely different set each time, so I ran it 10 times and recorded the results.

They seem to be random. I have not been able to discover any sequence or pattern, perhaps a mathematician or a statistician can do so?

Can it be that I've found a new use for the Slogger

Turbo Driver? I also have a request to make. Can we possibly have an article showing how to write assembly language programs making use of floating point arithmetic?

I want to program the Electron to sum the sequence of reciprocals. In Basic it is a simple matter but takes hour after hour, even with Slogger's Turbo Driver. — Allan L. Stevens, St. Andrews, Fife.

● The Electron's random number generator starts producing a sequence of random numbers when it is switched on. The point Philip Ord made is that the sequence produced is

always the same.

Every time you ask your Electron for a random number it works out the next in the sequence. So, when you run your program you're looking at a different part of this sequence.

Try switching your micro off, then switch on and run your program once only, making a note of the numbers.

Switch off, switch on then run it again and you'll find the same sequence is output — it always starts off at the same point.

There's an article and program in next month's issue dealing with the subject of floating point arithmetic in machine code.

## From Page 47

(Electron Power Pack)?

We can manage to avoid the bullets, but don't seem able to jump on to the boat as it doesn't come in far enough.

Also in Stranded (Computer Hits 3), we can't seem to get past the robot. We have tried all sorts of commands to no avail. The pick-axe and fuel capsule don't seem to help.

We bought the Electron for our son's Christmas present. He was thrilled, in fact we all are and already have had hours of enjoyment from it.

The television hardly ever gets watched nowadays and one of our favourite games is Snapper which came free with it. My wife has managed to score 83880 and the rest of us are catching up.

Thank you for Electron User which we enjoy reading and find very helpful and informative.

We have typed in quite a few of the programs, though not without mistakes, but we are gradually learning from our errors. — Pat and Joan Williams, Baltonsborough Glastonbury, Somerset.

● The listing is correct so you must have made a typing error when entering it. It is quite likely that you have confused 1 and l — one and lower case L.

It is quite a problem and with this particular program very easily done. We do look out for this sort of thing and whenever possible change l to L before listing it.

Watch out for ladd%, the first character is a lower case L not a one. Remember that all variables must start with a letter and the Electron will not accept 1add% with a one.

Can any readers help with tips on Wondo and Stranded?

## Sound effects

THE ELECTRON is a great little machine and the graphics it can produce are outstanding.

The standard of graphics

**WHAT** would you like to see in future issues of Electron User?

**What tips have you picked up that could help other readers?**

**Here is your opportunity to share your experiences.**

**Remember that these are the pages that you**

**write yourselves. So tear yourself away from your Electron keyboard and drop us a line.**

**The address is:**

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**Electron User**

**Europa House**

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drive and joysticks.

You'll find a full review in the November 1986 issue of Electron User. Also Advanced Computer Products is producing the Plus 1 originally made by Acorn.

## Mission impossible

AT LAST a game to challenge those produced by Superior Software. I am talking of course about one of the greatest computer games ever, if not the greatest — Impossible Mission.

After four days of continuous play, apart from going to school, I have completed it in four hours 48 minutes, scoring 14,962. Can anyone beat that?

Am I correct in thinking that this means more US Gold conversions for the Electron?

Please could you help my dad? He has a problem with Elite: Having reached Dangerous, he bought a galactic hyperdrive but it wouldn't work. Is there any way round this? — Peter McCosh, Torphichen, W. Lothian

● Impossible Mission is a great game and we would also like to see more US Gold titles on the Electron market.

There was a bug in early versions of Elite that prevented the galactic hyperdrive from working. Later copies don't suffer from this problem.

You can change galaxies occasionally if you keep hitting Control, H, V and the spacebar but more often than not it doesn't work.

## Analogue joystick

I AM the owner of a new Acorn Electron. The basic computer is all I have at the moment, but I would dearly like to use an analogue joystick.

As I've found it impossible to get a Plus 1, could you please tell me if there is an analogue joystick interface

in games has steadily improved over the past year or two. Although the Electron has only 32k of memory we are now seeing games that are comparable to those found on more powerful computers such as the Commodore 64 — Yie-Ar Kung Fu for instance.

However, with all the add-ons now available hasn't anybody ever thought of developing a sound synthesizer for the Electron, or isn't it possible?

I'm sure that if it is, there would be a huge market for such a device.

It would also be nice to hear my Electron "speak" as in Speech from Superior Software for the BBC Micro.

Keep up the good work. — A.J. Giljillan, Nottingham.

● There aren't any add-ons available to improve the sound of the Electron or add speech. Although it is possible it would be expensive, requiring both hardware and software.

## Electron Elite

I HAVE recently bought a Plus 3 and noticed on the outer package of the box three pictures of a Plus 3 in use.

Only when I looked closely at the third picture did I realise that it showed the BBC Micro disc version of Elite being played on a normal Electron with Plus 3 added.

Does this mean that a BBC Micro version can be found on 3.5in disc and if so will it work on an Electron? — Paul Adams, Redhill, Surrey

● Even though the screen quite clearly shows the BBC Micro version of Elite you

can't play the BBC version, whether on disc or cassette, on the Electron.

If you look very closely at the picture the Elite box next to the Electron says it's the BBC Micro cassette version and what's more the Electron isn't plugged in.

Are Acorn implying that we can play the BBC Micro cassette version of Elite on the Electron with Plus 3 without even plugging the micro in?

It's obvious that Acorn had a BBC Micro hidden under the table when the photograph was taken!

## Expanding horizons

I PURCHASED an Acorn Electron a few weeks ago from my local Currys and have decided that I would like to extend the basic machine into a more useful tool for my requirements, that is word processing and financial calculations.

After some research into the availability of equipment for the computer, I find to my horror that all the Electron Plus 1 interfaces have been sold, so I am faced with the problem of extending it to my requirements.

I must be one amongst hundreds of people faced with the same problem: Is there a Plus 1 substitute, if so, where?

I would be very grateful for any information which you could provide in order to help with my enquiries. — R.N. Ward, Harrogate, North Yorks.

● Sloggers's Rombox Plus will provide you with everything you need — the ability to plug in roms and cartridges, printer, disc

available? — **Andy Mountney, Drimpton, Beaminster, Dorset.**

● The only analogue joystick interface available for the Electron is the Plus 1.

Acorn no longer manufactures it but it has been taken up by Advanced Computer Products who now produce it.

Many interfaces are available, such as the First Byte, to enable you to use switched Atari style joysticks. Some games players prefer these.

## Serious software

I WOULD like to know if Logo is available for the Electron. I'm writing because our class are doing Logo at school.

I haven't a Plus 1 so I can't take advantage of the answer given to Stuart's letter in the March 1986 issue of Electron User.

I would like to know where I can buy it and the price please. — **Colin Markwell, Ipswich, Suffolk.**

● Turtle Graphics — a subset of Logo is available on cassette for £2.95 from MicroPower at 8, Regent Street, Chapel Allerton, Leeds LS7 4PE. Our serious software series will be looking at Logo in a later issue.

## Listing errors

AFTER purchasing a copy of your February 1987 issue, I attempted to enter your listing of Maze on pages 33-36. It would not run.

I spent several hours checking the magazine against my listing and not finding any difference I think that there may be an error in the published listing.

I found the two lines which appeared to be printed incorrectly — 1000 and 1040.

Could it be that the last line in column 2 page 35 should be the second line in line 1040?

No matter how I change the program I still get either Syntax error line 1790 or

Mistake in 1790. — **I.C. Satherley, Filton, Bristol.**

● Unfortunately there is an error in these two lines — somewhere along the line they became muddled. They should read:

```
1000 DEFPROC17:MOVE507,0:DRAW1819,0:DRAW1819,425:DRAW896,449:DRAW896,123:DRAW507,123:MOVE1819,0:DRAW896,123:ENDPROC
1040 DEFPROCddoor:GCOL3,1:MOVE385,0:DRAW417,123:DRAW601,123:DRAW633,0:DRAW385,0:MOVE463,123:DRAW439,0:MOVE509,123:DRAW509,0:MOVE555,123:DRAW579,0:GCOL3,2:VDU5:MOVE561,80:VDU141,4:ENDPROC
```

The rest of the listing is correct and it sounds like you've made a typing error in the machine code section. Check lines 1460 to 1730.

## Bargain basement

I HAVE just subscribed to Electron User and at the same time have taken advantage of your tremendous offers on the Plus 1 with View and the Plus 3 with Database and I am very pleased. What a bargain!

As well as the Electron I also own an Amstrad CPC6128 and since Database publish Electron User and Computing with the Amstrad (both very good magazines) I think you will be able to answer my question.

The Amstrad is, as you know, sold with a monitor — in my case the colour version which I would put at roughly medium resolution as I find

no problem using 80 columns when word processing.

I was wondering if it was possible to use the Amstrad monitor with my Electron, not as a power supply, but purely as a monitor. Is the idea feasible?

I hope you can be of some assistance. Keep up the good work on both magazines. — **Barry Nolan, Nelson, Lancs.**

● The Amstrad monitor can be used with the Electron. The display isn't as good as a monitor designed for the BBC Micro or Electron, but it is better than a TV.

But you may find that the top line of the display is off the top of the screen and the picture slightly dull.

## Transferring game tapes

I AM now totally confused. My dad bought me a Plus 3 for Christmas and naturally I want to copy all my tape-based games on to disc.

I bought Electron User last December and noticed T2P3, a rom made by Slogger. I phoned Gamer of Brighton and they told me that I needed a Plus 1 to use T2P3.

Please could you tell me if this is true? — **Leon Penny, age 13, Hastings Old Town, E. Sussex.**

● You need a Plus 1 and blank rom cartridge or Slogger's Rombox to plug roms in as there aren't any sockets within the Electron or Plus 3.

## Jumping to conclusions

PLEASE could someone tell me how to use the jump facility in Superior Software's Ravenskull?

I have collected all the treasures without losing a life, but no matter when or how much I hammer the J key, it will not produce a jump.

Do you have to use the lightning scroll in some way? Please tell me where and how. I don't know what to do. — **Paul Askew, Bishopsmead, Tavistock, Devon.**

● Can any readers help Paul with a solution to Ravenskull?

## Compatible recorder

HAVING bought Electron User since February, 1984 I must congratulate you on this excellent publication.

Your bugs hunt series has helped me in starting to correct my errors in the Chess Timer program.

In answer to Fraser Johnson's question in the November 1986 issue of Electron User about a compatible cassette recorder: I use a Philips D6340 and find once the tone and volume are set I can load most programs. — **W. West, Kent.**

## Games tips needed

RECENTLY I bought the Five Star games pack including Geoff Capes, Deathstar, Twin Kingdom Valley, Repton and Combat Lynx.

I was greatly disappointed at the instructions provided for Geoff Capes and Combat Lynx. They seem to be poorly explained.

Please could you tell me how to start off on these two games? — **J. Wilson, Whitburn, Tyne and Wear.**

● Can any readers help with some tips and clues for these games?

ALL programs printed in this issue are exact reproduction of listings taken from running programs which have been thoroughly tested.

However on the very rare occasions that mistakes may occur corrections will be published as a matter of urgency. Should you encounter error messages when you type in a program

they will almost certainly be the result of your own typing mistakes.

Unfortunately we can no longer answer personal programming queries concerning these mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in the mail pages.

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Nim  
Odd Man Out  
Pelmanism  
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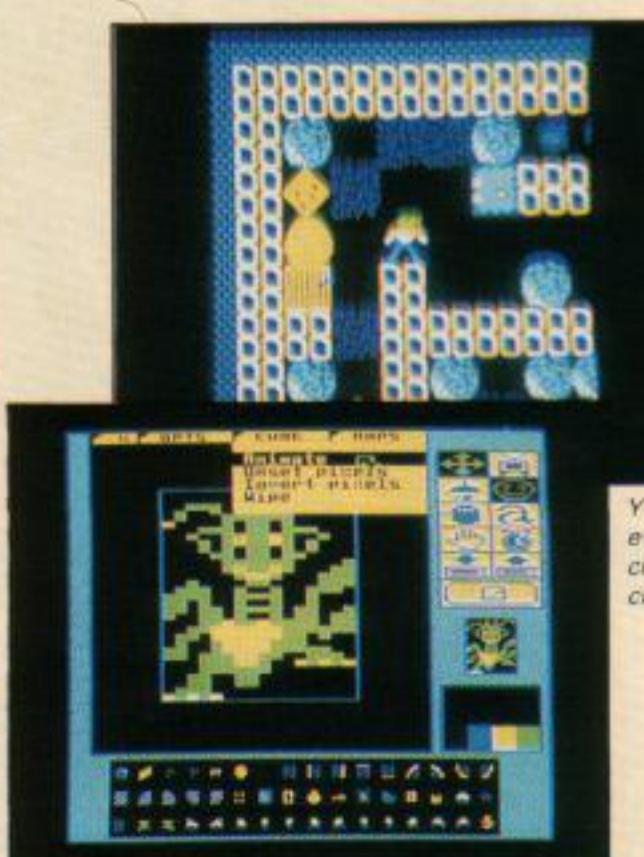
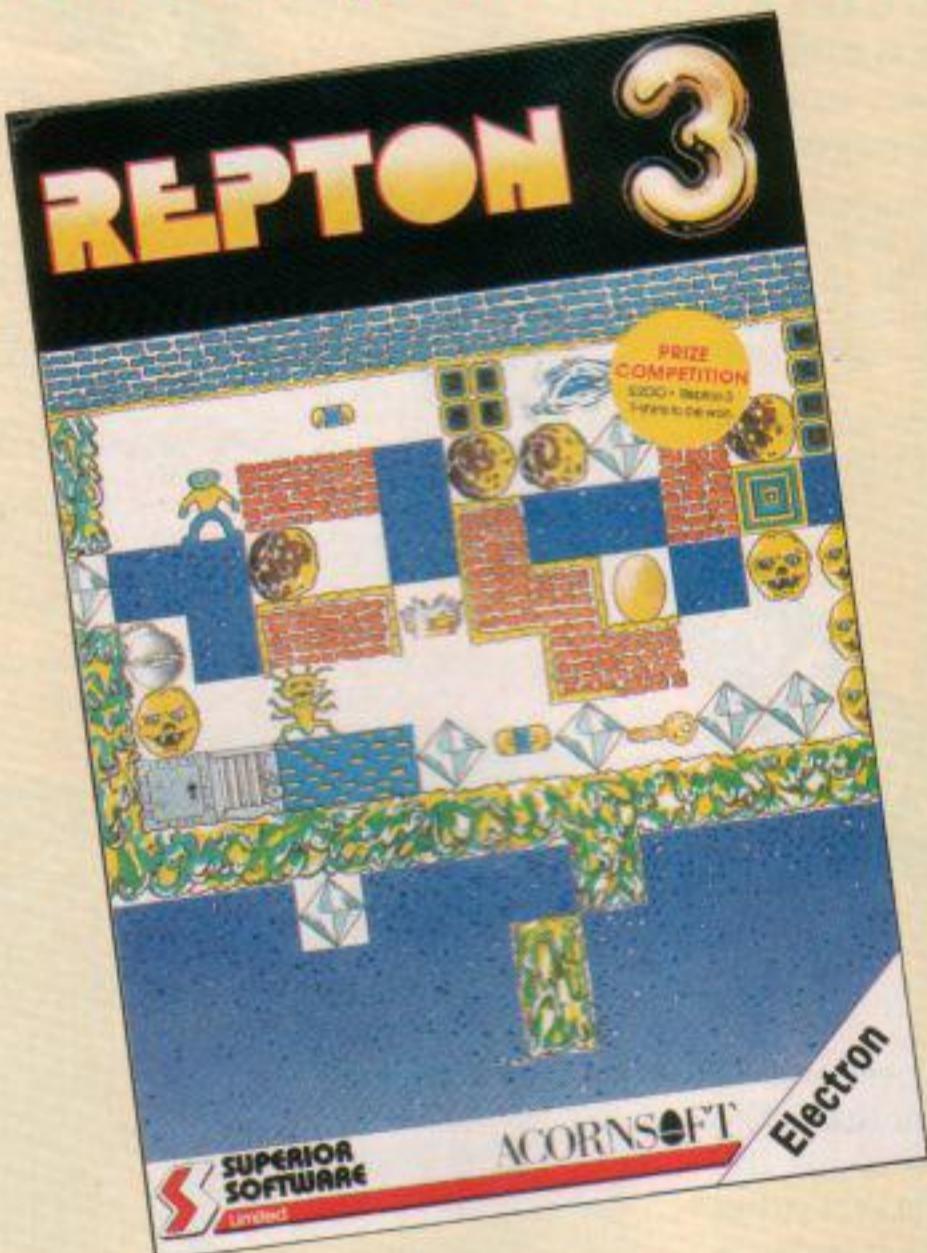
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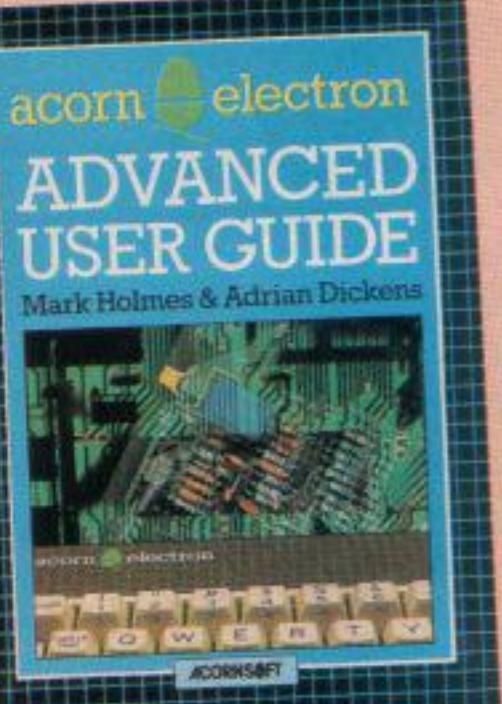
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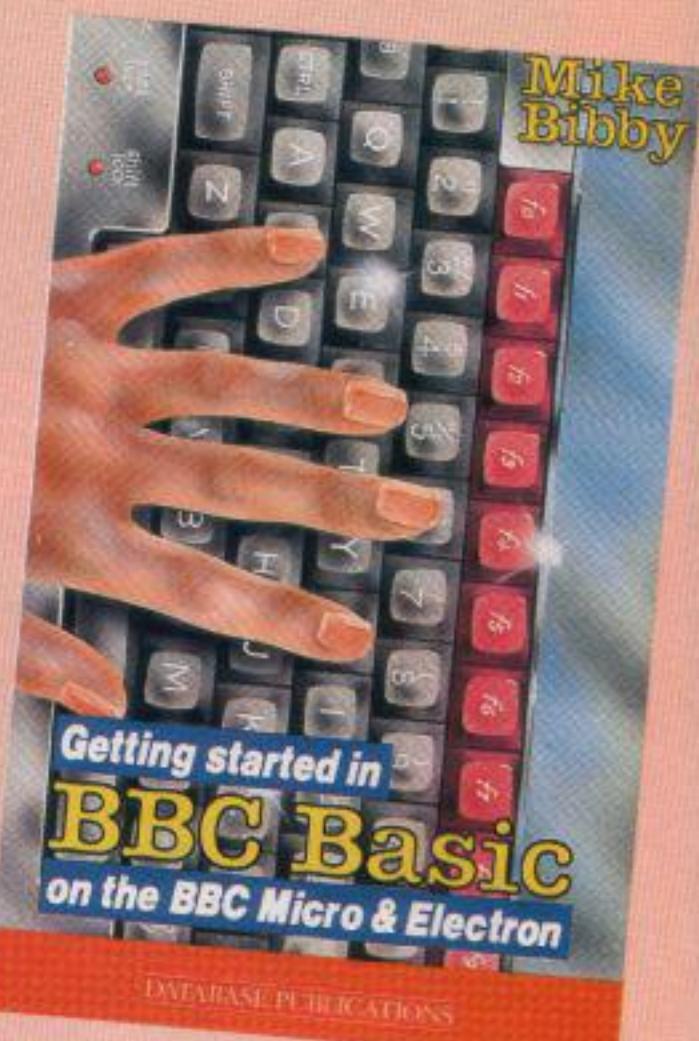
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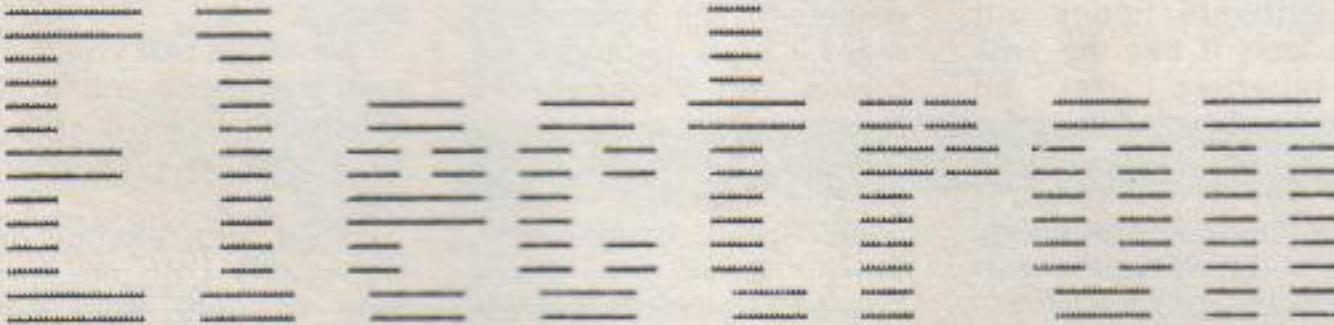
## LINERS

## Big Letters

THIS handy routine from N.Gorton prints text in extra large characters across the screen. Type in a string at the prompt then sit back and watch. The string is first printed at the bottom of the

screen in black ink on black paper so you can't see it.

However, your Electron can and it looks at each pixel in turn, enlarging and redrawing them in the middle of the screen.



```

1 MODE 5:VDU 19,1,0;0;
2 INPUT'ENTER A WORD';WORD
3 IF LEN(WORD$)<6 CS%=4 EL
SE CS%=2
4 LW%=LEN(WORD$)*64
5 SP%=640-(LW%/2)*CS%
6 CLS:VDU 5:GCOL 0,1:MOVE
0,32:PRINT WORD$:GCOL 0,2
7 FOR X%=0 TO LW% STEP 4
8 FOR Y%=0 TO 34 STEP 2
9 IF POINT(X%,Y%) PLOT 69,
SP%+X%*CS%,500+Y%*8: PLOT 69,SP%
X%+CS%,502+Y%*8: PLOT 69,SP%
8+X%*CS%,502+Y%*8: PLOT 69,SP%
2+X%*CS%,502+Y%*8: PLOT 69,SP%
10 NEXT:NEXT

```

## Road Racer

TRY your hand at grand prix racing with this exciting simulation by David Harrington. It features multiple skill levels, fog and fast screen scrolling. It also records the best score so far. Use Z and X for left and right.

Some of the lines are very long and you'll have to abbreviate the commands whenever possible otherwise you won't be able to type them in. These can be found in the user guide.

```

1 Q=1:R%=8:S%=0:H%=200:N$=
ELK:MODE5:COLOUR2:VDU23,255,
90,126,90,24,219,255,255,219,2
3,254,31,32,64,255,128,128,255
,0,23,253,255,3,5,249,10,12,24
8,0,23,252,68,68,68,24,255,24,
36,195,23,8202;0;0;0;:PROCmenu
*:FX16
2 CLS:CX=R%+2+W%/2:COLOUR1
:FORs=1TO16:PRINTTAB(R%,s)CHR$254:CHR$253:SPC(W%);CHR$254;CH
R$253:NEXT:FORa=1TO13:?(2240+a
)=1:NEXT:VDU31,CX,16,255:COLOU
R2:FORg=3TO8STEP-1:SOUND1,-15,
100,1:VDU31,0,1,g+48:FORp=1TO1
000:NEXT:,COLOUR1
3 SOUND1,1,150,15:VDU31,CX
,16,32:GCOL0,1:ENVELOPE2,1,-1,
1,-1,1,1,1,1,1,1,1,1,1:SOUND1,
Q,20,255:REPEATOSCLI'FX19':VDU
31,CX,16,255:OSCLI'FX19':VDU31
,CX,16,32:S%=S%+1:CX=CX+INKEY
(-98)-INKEY(-67):PROCr:UNTILPO

```

```

INT(CX*64+16,496)=1
4 SOUND0,-15,6,30:VDU31,CX
,16,252:WIDTH1:COLOUR3:PRINTTA
B(0,0)"You crashed. But scored
";S%:WIDTH255:OSCLI'FX15,1:FO
Rp=1TO5000:NEXT:CLS:IFS%>HXVDU
19,2,9,0;:COLOUR2:PRINT"** N
ew High Score **":COLOUR3:INPU
T'Enter your name:"N$:H%=S%
5 CLS:VDU19,2,6,0;19,3,5,0
:PRINT"....Road Racer.....
"TAB(5)Written by"TAB(2)"
David Harrington":COLOUR2:PRIN
T"Last score was"SY"Hi
gh score is"SY"By"TAB(5)
NS"Press SPACE to play.":RE
PEATUNTILINKEY(-99):R%=8:S%=0:
PROCmenu:GOTO2
6 DEFPROCr:IFR%>0ANDRND(1)
<.45R%=R%-1ELSE IFR%<(15-W%)AN
DRND(1)>.55R%=R%+1
7 PRINTTAB(R%,0)CHR$254;CH
R$253:SPC(W%);CHR$254;CHR$253;

```

```

CHR$11:ENDPROC
8 DEFPROCmenu:CLS:VDU19,2,
2;0;19,3,4;0;:F%=0:W%=4:COLOUR
2:PRINT"....Road Racer.....
":COLOUR3:PRINT"TAB(8)Menu"
:COLOUR2:PRINT"1-Default opt
ions"2-Change options":REPEA
TM=GET:M=M-48:UNTILM>0ANDM<3:I
FM=1GOTO1ELSE PRINT"Road W
idth(2-6)?"
9 REPEATW%=GET:W%=W%-48:UN
TILW%>1ANDW%<7:PRINTW%"Fog"
"0=No Fog"8=Low Visibility
":REPEATF%=GET:F%=F%-48:UNTILF
%>-1ANDF%<9:PRINTF%"Engine
Sound"0-off"1-on":REPEATQ
=GET:Q=Q-48:UNTILQ>-1ANDQ<2:IF
Q=1 Q=2
10 IFF%>0VDU19,1,1;0;:ENDPR
OC ELSE VDU19,1,8;0;:OSCLI'FX9
,+STR$(5*F%):OSCLI'FX10,+STR
$(9-F%)*3):ENDPROC

```

YOU  
crashed  
but  
scored  
16

# Time to put pen to paper

WHILE gazing at my astrolabe during Lent, I was mortified to read of impending despair for Electron and BBC Micro adventurers.

Level 9 Computing – probably the greatest adventure software house for any home micro in this country – intends to pull out of the BBC Micro market and abandon plans to recode its adventures for the Electron.

On the surface it appears to be the age-old problem of a company which has grown to such a size that it deems it unprofitable to continue releasing adventures for a disc-based BBC Micro market and doesn't have the time to enter the realm of the Electron.

I believe Level 9 did approach Robico with a suggestion to convert its current 10 titles for the Electron, but Rob O'Leary was understandably busy

enough with his own successful series of adventures.

In collaboration with *Micro User* I ask you to write in your thousands to urge Level 9 to have a change of heart and to prove that Electron owners are the most dedicated and loyal adventurers around.

I also put out a plea that if any software house out there feels it has the time and expertise to take on board the Level 9 titles for the Electron, it should also write to: Mrs Margaret Austin, Level 9 Computing, P.O. Box 39, Weston-super-Mare, Avon, BS24 9UR.

How about it, Superior or Epic or someone?

The good news this month includes a message from King Pellinore that Larsoft's new adventure, *The Puppet Man*, has now been released for the Electron.

It follows in the tradition of *The Nine Dancers* and is

an essential purchase for any discerning adventurer.

I have also received a copy of Orbit Software's *The Banished Prince*. After a cursory ramble it confirms my belief that the general standard of adventures is improving all the time.

Also in a brighter vein may I take time to thank readers for the multitude of maps I have received for *Circus* and *Philosophers Quest*.

I should like to thank especially James Ritchie, John Tipper, Derek Cheal, Toby Bedding, Mark Deehan, Graham Thompson and Lee Harland for their most concise solutions.

Don't forget that there's a copy of Adventure Soft's *Rebel Planet* waiting for the first solution to *Castle of Riddles* to arrive on my desk.

I have been sent many requests for help with *Savage Island Part 1* – a most difficult adventure.

I have managed to decompile the room descriptions and obtain a complete verb list but am totally stuck solving the force field problem.

I therefore have a copy of Larsoft's *Wychwood* to give away in exchange for a complete solution to this teaser.

Terry Gammon has written to query Martin Hanson's solution to *Robin of Sherwood* in last September's Hall of Fame.

It appears that the sequence involving the capture of the Sheriff isn't quite correct. Can any one send me a flawless solution?

On the subject of unsolved problems, I have recently received letters from Mary and Derek Cheal of Wooton Bridge and Geoff Livesey of Maastricht asking



for assistance with *Island of Secrets*.

I am afraid that I have not seen this game and would generously reward anyone for a solution – or even a copy of it.

I must also reiterate that regrettably I do not have time to give help with arcade games such as *Citadel* and *Jet Set Willy*.

This column is dedicated to text adventures only – albeit that a few, such as *TKV*, also have graphics.

Quite a few people have written to me asking what has happened to *Hall of Fame*.

I have a stockpile of excellent offerings for this section and promise to reintroduce it in a couple of months time.

In the meantime I am continually fighting for space for everything else, such as listing when help has been given in the past for particular adventures.

This month it is the turn of *Sphinx Adventure*.

The following back issues will furnish you with the most useful help: August, October and November 1985, January (Special), April, May, August, September, October and November 1986, January 1987.

Jos Van Eijden of Cereslaan 63, 1402 LH Bussum, The Netherlands, would like to hear from any Electron adventurers who would like to correspond with him.

That's all for this month, so until the cryptic becomes logical, happy adventuring.

## KNIGHTS OF THE ROUND TABLE

This section is dedicated to fellow adventurers who offer help with specific adventures. If you write to one of my Knights, don't forget to enclose a stamped addressed envelope.

This month I begin by reknighting Sir Tony Haynes of 78 Rowden Drive, Lyndhurst Estate, Erdington, Birmingham, B23 5UH, who after a spot of questing has returned with an enlarged batch of adventures with which he can offer assistance:

Adventureland, Arrow of Death parts 1 and 2, Circus, Crown Jewels, Countdown to Doom, The Count, Castle Frankenstein, Feasibility Experiment, Galadriel in Distress, Golden

Baton, Gremlins, Ghost Town, The Incredible Hulk, Kingdom of Klein, Mystery Fun House, Pirate Adventure, Pyramid of Doom, Perseus and Andromeda, Quest for the Holy Grail, Ring of Time, Staff of Law, Sphinx Adventure, Secret Mission, Strange Odyssey, Super Agent Flint, Stranded, Stolen Lamp, Ten Little Indians and Wheel of Fortune.

Also kneel and arise Sir Steven Leonard of 57, Lincoln Avenue, Nuneaton, Warwickshire, CV10 9LX, who can offer help with the following: Arrow of Death parts 1 and 2, Crown Jewels, Circus, Sphinx Adventure, Stolen Lamp, Ten Little Indians and Terrormolinos.

## PROBLEM SOLVED

I would like to begin this section by thanking Mr R. Asher for his superb solution to *Wheel of Fortune*. If anyone would like a copy, please send a large stamped addressed envelope.

I have been quite overwhelmed by the number of requests for help I have received for *Hampstead*.

I hope that the current series of maps of this adventure will provide respite, but for some of the more desperate cases:

James Hauxwell asks how to avoid getting mugged – find some means of transport James.

Stephen McGlynn has been trying to go the wrong way up a one-way street – catch a train instead.

Des Docherty needs to know whether to take the dogs or the book from the Oxfam shop – don't bother with either of these pretentious items.

And Tom Duchin can't find the cocktail party – visit a few bars Tom.

One of Merlin's Lords of Adventure, Chris Lowe, wishes it to be known that he lives in Chaddesden and not Chaddeston as printed in last November's *Electron User*.

Chris also asks how to move the old dragon in *Sorcerer of Claymorgue Castle*. Geoff Larsen kindly gives the following sequence as an answer: EXAMINE DRAGON – THROW DUST – GO HOLE.

Both Chris and Lee Horland provided me with the following calls to rerun Adventure Soft games if you should accidentally press Break. Apparently both CALL &1E2E or CALL &1D9B will work.

Mary and Derek Cheal seem to have problems in moving through the hollow tomb in Usborne's *Silver Mountain*.

I think you need to clear the rubble from the end of the passage and then use your new-found route as an alternative to crossing the bridge.

In exchange, Mary and Derek sent me some vital

information to help with Peter Armstrong's problem in the same game.

He should empty the phial into the goblet in the mosaic floored hall, return to the stable for the horseshoe, give the brooch to the hermit and get the ring from the well.

Having achieved all that they confidently inform me that Ogban will be dead when you return to the hall.

Tony Rainbird has been driven to distraction by the bull in *Rick Hanson* – I know the feeling, Tony.

You must dodge the bull after waving the red seat cover or you're bound to meet a gory end.

In *Project Thesius*, Grant Rencourt is stuck trying to enter the castle. You have

done well to get so far, Grant – now look for a manhole and put that spanner to good use.

I have a feeling that this last paragraph should be titled Kansas corner.

Mark Deehan and James Bainbridge appear to have frog catching problems in *Revenge of Zor*. If you fish in the dark marsh with the net and drop a few flies as bait you are bound to get lucky.

In *Ring of Time*, the saddle is in the safe, Mark.

Finally, D. Broughton asks how to carry the oil and whether he can enter the secret passage in *Dracula Island*.

You need to fill your lantern with oil and then light it to enter the subterranean passage.



## BEGINNERS

In the past two issues I have dwelt briefly on pictorial methods of mapping an adventure. I now wish to ponder upon a rather more sophisticated method.

For the following logical procedure I am deeply indebted to my colleague in *Micro User*, The Mad Hatter.

Each location encountered is given a room number – hence the opening room is usually numbered 001.

There then follows a précis of the room description; in the inset of the first few locations of *Twin Kingdom Valley* – I have called the opening scenario "Road outside cabin".

Then list the exits and the result of moving in a particular direction – this usually results in a new room number. Hence moving North East from 001 in *TKV* takes me to a babbling brook at 006; or moving North results in my entering the cabin at 002.

To begin with it is prudent to make such jottings on rough paper until a pattern emerges such as that displayed in Table I.

Then all the relevant

information can be transcribed to neat lined paper or a View file.

It is unimportant how you number the rooms, as long as each location has a different number and you are aware of your own numerical logic.

What is important, however, is that you annotate in the description box any treasures or objects which you may find on your journey.

I can vividly remember during my first excursion through *Sphinx Adventure* that I came across some Stilton cheese in the goblin's dairy but forgot to make a note of its location.

Later I discovered a mouse scurrying around the castle dungeons but all efforts I made to catch it failed. It then dawned on me that mice like cheese, but could I remember where I had seen that Stilton?

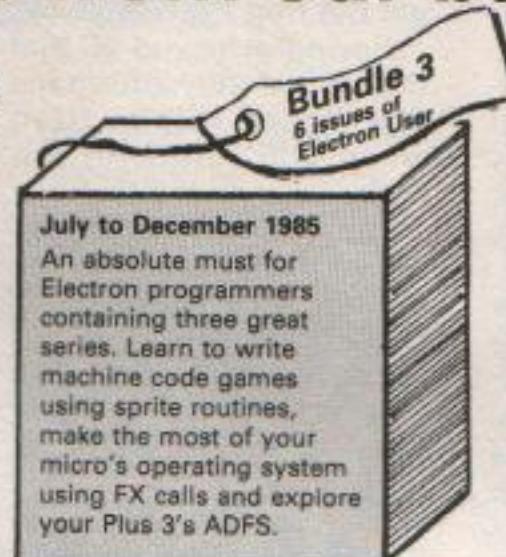
It took some two hours of hitting the keys and a few choice profanities before I could retrace my steps to the dairy and that prized blue-veined morsel.

I certainly made sure that I became more thorough in my mapping after that.

Next month I will look in more depth at problem solving skills.

Room	Description	Exits	Move	Result
001	Road outside cabin	Cabin Babbling brook Road Road	N NE W E	002 006 003 004
002	Cabin(Jug,Lamp, Keys)	Outside cabin	S	001
003	Road	Clearing Outside cabin Quarry	N E W	005 001 016
004	Road	Outside cabin Spring Road Woods	W N E S	001 007 009 008

Table I: Mapping the first few locations in *Twin Kingdom Valley*



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## Programs from Electron User – on tape £3.95 each!

### April 1987

**DRAGON'S DOOM** A fun educational game for youngsters learning to tell the time. **GRIDDER** A fascinating puzzle that will strain your brain. **WIMPS** A complete desktop environment with windows, icons, menus and pointers. **10 LINERS** Two short, yet impressive listings.

### March 1987

**SUPER BOSS** Try for the league and FA cups in this exciting football management simulation. **AWARI** A classic African board game for one or two players. **ELKZAP** Recover lost files with this powerful Plus 4 disc editor. **10 LINERS** Two short, yet impressive listings.

### February 1987

**MAZE** Escape from the creepy castle. **KEYBOARD PLAYER** Turn your micro into an electronic organ. **TOMMY** Guide little Tommy through the woods. **CARPET** An impressive graphics display. **GCOL** Experiment with extra colours. **10 LINERS** Two short but impressive listings.

### January 1987

**GRID WARRIOR** Battle with alien gladiators deep in space. **MODE 7** A Mode 7 simulator providing teletext graphics. **SMILEY HUNT** The final version of AI's scintillating magagame. **10 LINERS** Zap the alien intruder and dodge the asteroids. **LISTER** A utility to enable you to list programs directly from disc or tape.

### December 1986

**SANTA'S SLEIGH** Help Father Christmas fill his sleigh with presents in this fast arcade game. **YULE SPELL** Spelling can be fun with this seasonal variation on the old favourite hangman. **POGO** A Logo turtle graphics compiler. **FUNCTION KEY LISTER** Keep track of your function key definitions with this helpful utility. **10 LINERS** Two short but impressive graphics demonstrations.

### November 1986

**TRAIN TROUBLE** You've just robbed a bank. Can you escape the forces of law

and order in this chase over the carriages of a fast moving express? **DAY AT THE RACES** You can gamble away to your heart's content in safety with our entertaining two player horse racing game. **BASIC COMPILER** This superb utility will turn your Basic programs to machine code in no time at all. **10 LINERS** A routine from our fascinating series of short programs.

### October 1986

**RAT CATCHER** Try your hand at pest control with this fast action arcade game. **MATHS RUN** Put your powers of mental arithmetic to the test with this educational program. **BOS** This on screen editor will take the tedium out of debugging listings and sort out your typing slips. **CROSSWORD** Two programs for crossword lovers – one to design crosswords and the other to help you solve them. + **BONUS game: QUASIMODO'S QUEST** Rescue Esmeralda in this colourful version of the all time favourite.

### September 1986

**CAVERN CAPERS** Blast your way from the depths of the labyrinth to escape from the planet. **DRAW WRITER** A superb utility to translate your on screen graphics to the procedures to create them. **COMPANY COUNT** Work your way up the company pecking order in this educational maths test. **TEN LINERS** Another short but fascinating program. + **BONUS game: ROCKFALL** Go diamond mining in this intriguing multi-screen arcade romp.

### August 1986

**HOWZAT!** A vivid recreation of a day's test cricket for two players. **3D MAZE** Quick reactions and a sense of direction are needed to escape from our twisty maze. **TEXTED** Let this versatile text editor turn your micro into an electronic typewriter. **DRIVER** A powerful printer driver for View.

### July 1986

**ROYAL WEDDING** Celebrate the royal event with our ingenious sliding block puzzle. **SNAPDRAGON** Two player

version of the classic card game.

**ATTRIBUTES** Colourful two player strategy game. **FORMATTER** Make your listings easier to read. **DISCS** Extended star commands. **EXTRA COMMANDS** A WHILE . . . WEND command for your micro. **PLUS** superb digitised picture of Andrew and Sarah.

### June 1986

**FISHING** Enjoy a quite day by the river, and maybe catch your tea as well! **TACTICAL PURSUIT** A two player strategy game played with pawns on a chess board. **MINIBASE** Create an electronic telephone directory. **EXTRA COMMANDS** Add more commands to Basic. **SCREEN DUMP** Multi-tone screens dumps for Epson compatible printers.

### May 1986

**MISSILE JAMMER** Defend the city of Pezina from a missile invasion. **VECTOR LETTERS** Use \*LINE to create double height text. **DEGREES** Convert from Centigrade to Fahrenheit and vice-versa. **CROCODILE TEARS** Spell well or end up as a crocodile's dinner. **ZAP** Blast the marauding aliens. **EXTRA COMMANDS** Adding new keywords to Basic.

### April 1986

**INVASION FORCE** Exciting zap 'em space game. **EASTER EGG HUNT** Seasonal game using compass points. **BACH TO BASICS** Music tutor. **NOTICE BOARD** Text scrolling utility. **SEARCH** and **RECOVER** Two routines from the disc article. **NOTEBOOK** Recursion backwards.

### March 1986

**GRAND PRIX** Exciting race game. **DICER** A clever test of strategy. **MARCHING ORDER** Counting and ordering numbers. **FIND AND REPLACE** Useful editing program. **SECTOR EDITOR** Excellent disc utility. **TIMEPIECE** Superb graphics demonstration. **OXO** Game of cunning. **TRICIRC** A circle of triangles.

To order, use the  
form on Page 53

# The PLOT thickens...

STRAIGHT down to work this time as we put our Electrons into Mode 5 with:

MODE 5

and start to draw a line with:

PLOT 4,300,300

which moves the graphics cursor to point 300,300 followed by:

PLOT 5,500,500

which actually draws the line.

One thing that we've taken for granted about the lines that we've made is that they are solid and drawn in the current foreground colour. However, as the song goes, "it ain't necessarily so". You'll see this if you move the cursor back to 300,300 with:

PLOT 4,300,300

and then apply a quick:

PLOT 7,500,500

After doing this, the line running from 300,300 to 500,500 disappears. It's as though we've applied CLS or CLG to just a portion of the screen.

The clue to what's happened is in the 7 of the PLOT 7. This is a code which tells the Electron to draw a line, but in the background colour rather than the foreground colour we've used before.

A line drawn in this way blends into the background, effectively disappearing.

Since our line in the

background colour uses exactly the same coordinates as our previous one in the foreground colour, the result is that our first line disappears.

The coordinates used with PLOT 7 are absolute coordinates. Readers with an enquiring mind (or just a good memory for how our previous plots worked), will probably suspect the existence of a similar PLOT using relative coordinates. It exists in the form of PLOT 3.

Program I shows PLOT 7 in action with Table I summing up all the PLOTS so far.

Try changing the PLOT 7 of line 110 to PLOT 3. Can you explain what happens when you run it?

One thing all our PLOTS

have had in common is that they all produce solid lines. All right, I agree that sometimes we may not be able to see them, but they're there.

There is a set of PLOT codes that allows us to draw dotted lines. The codes are very similar to our previous PLOTS and are shown in Table II.

Let's put the Electron into Mode 1 with:

MODE 1

and try to draw a dotted line. From Table II we can see that we use:

PLOT 21,500,500

to give us a dotted line going from 0,0 to 500,500. Following this:

PLOT 20,0,0

takes the cursor back to the bottom left corner of the screen. From here we can draw a similar line using:

PLOT 23,500,500

This dotted line, however, is drawn in the background colour. The result is that our first dotted line disappears.

As you can see from Table II, there are relative dot commands as well as the absolute ones we've just explored. To see them at work, move the graphics cursor to 400,400 with:

PLOT 20,400,400

Now we can get:

PLOT 17,200,200

to draw a dotted line to 600,600. Following this with:

PLOT 16,-200,-200

has our long-suffering

Code	Action
0	Move relative to last point
1	Draw relative to last point
3	Draw relative in background
4	Move absolute
5	Draw absolute
7	Draw absolute in background

Table I: Where PLOTS draw the line.

Code	Action
16	Move relative to last point
17	Draw relative to last point
19	Draw relative in background
20	Move absolute
21	Draw absolute
23	Draw absolute in background

Table II: Dotty PLOTS.

```

10 REM Program I
20 MODE 0
30 FOR Loop=0 TO 9
40 PLOT 4,Loop*100,Loop*100
50 PLOT 5,Loop*100+100,Loop
*100+100
60 NEXT Loop
70 FOR delay=1 TO 500
80 NEXT delay
90 FOR Loop=0 TO 9 STEP 2
100 PLOT 4,Loop*100,Loop*100
110 PLOT 7,Loop*100+100,Loop
*100+100
120 NEXT Loop

```

Program I

‘But it ain't necessarily so...’

# Graphics

## From Page 59

cursor moving down back to 400,400 again. Finally we can erase the dots using:

PLOT 19,200,200

The similarity between the PLOT codes in Table I and those of Table II is striking. The actions of corresponding codes are exactly the same except for the line produced being

10 REM Program II	130 PLOT 5+offset+switch,400
20 MODE 1	,100
30 PROCwindow(0,0)	140 PLOT 5+offset+switch,400
40 PROCdelay	,800
50 PROCwindow(0,2)	150 PLOT 5+offset+switch,100
60 PROCdelay	,800
70 PROCwindow(16,0)	160 PLOT 5+offset+switch,100
80 PROCdelay	,100
90 PROCwindow(16,2)	170 ENDPROC
100 END	180 DEF PROCdelay
110 DEF PROCwindow(offset,switch)	190 FOR delay=1 TO 1000
120 PLOT 4+offset,100,100	200 NEXT delay
	210 ENDPROC

Program II

solid or dotty.

This is the result of an offset of 16 between the codes. PLOT 5 draws a solid line, PLOT 21 (5+16) a dotted one.

Similarly PLOT 1 draws a solid line using relative coordinates, while PLOT 17 (1+16) does the same for dotted lines.

This offset idea is extremely useful. For a start it enables you to learn just

Solid	Dot	Action
0	16	Move relative to last point
1	17	Draw relative to last point
3	19	Draw relative in background
4	20	Move absolute
5	21	Draw absolute
7	23	Draw absolute in background

Table III: All the PLOTS so far.

one "family" of PLOTS and simply add the required offset to get another. All the dotted PLOTS are the solid ones with 16 added.

In fact the idea of an offset can be used inside a family. All the relative coordinate PLOTS are 4 less than the corresponding absolute coordinate plots.

Table III sums up all the codes we've used.

The idea of the offsets is much more than a memory aid. It can be used in programs to get the same bit of

code to do several different jobs.

To see what I mean, have a look at Program II, where PROCwindow draws four different rectangles, depending on the offsets sent to it.

Explore it and see how it works. Then try extending it to draw a rectangle of any type and size, anywhere on the screen.

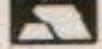
● That should keep you busy until next month when we'll be looking at the points involved in yet further PLOTting.

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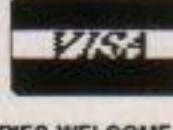
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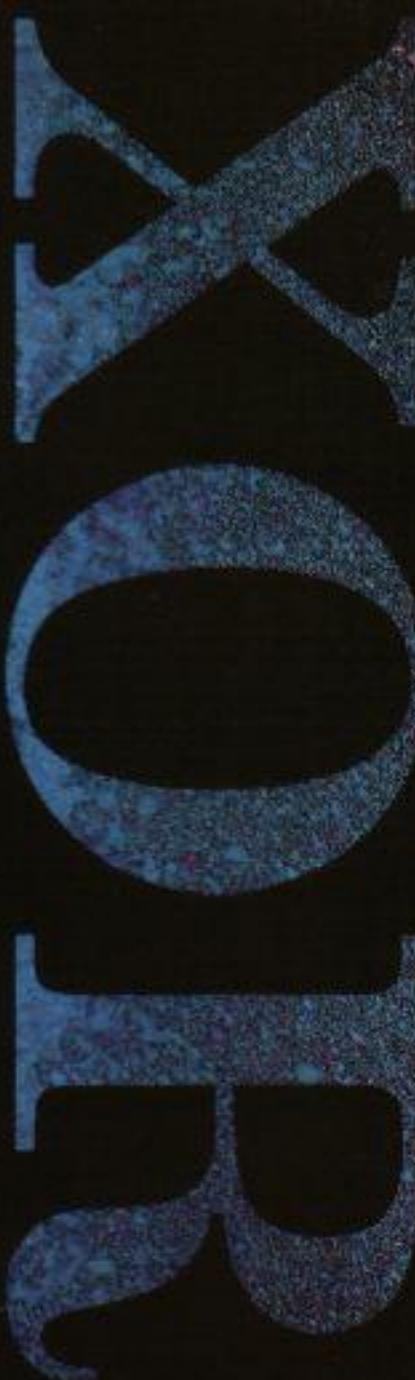
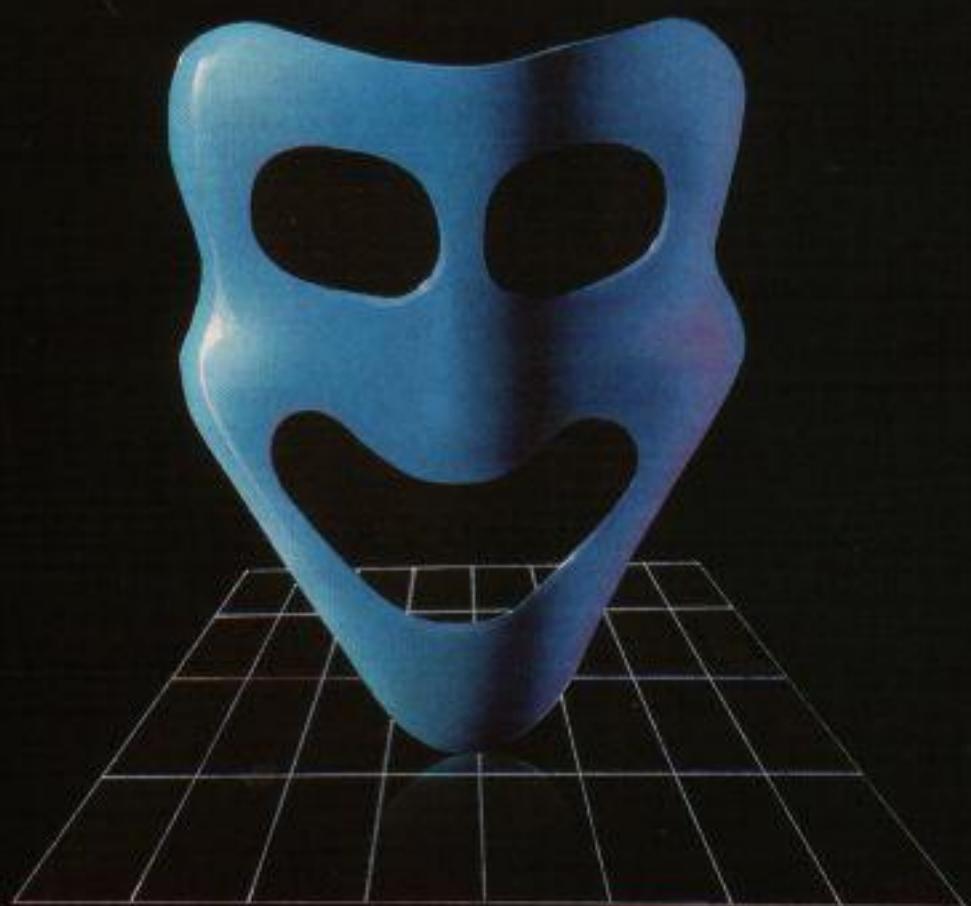
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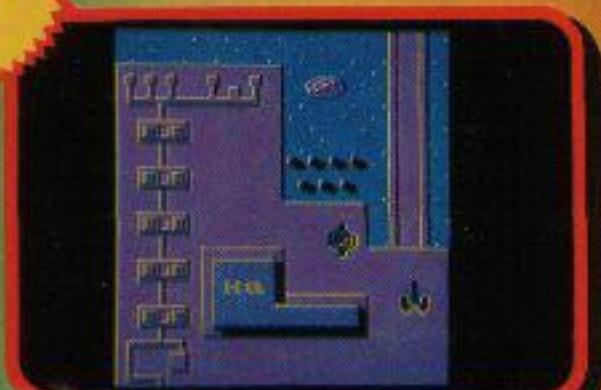
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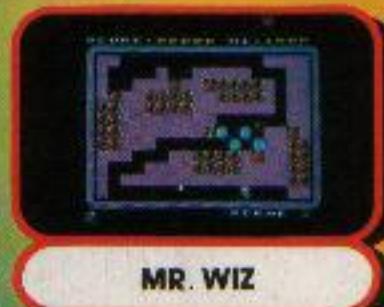
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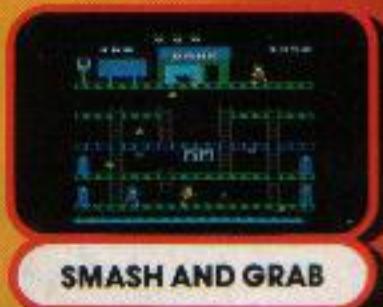
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